



NEW PROPOSITIONS IN
SPECULATIVE AND PRACTICAL
PHILOSOPHY

LYSANDER SALMON RICHARDS



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NEW PROPOSITIONS
IN
SPECULATIVE AND
PRACTICAL PHILOSOPHY



BY
Lysander Salmon Richards,

Author of "Vocophy: Indicating the Calling One is Best Fitted to Follow,"—“The Birth, Development and Death of Our Planet in Story,”—“The Universe: a Description in Brief,—and “The History of Marshfield.”

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PREFACE.

The following pages are from my published and unpublished writings, which I have collected and put together in this small volume for the purpose of preserving in a compact form some original propositions and presentations that I have introduced in the realm of philosophy and mental and physical science. I use the term original propositions and presentations because I believe them to be new. At least they are new and original to me, never having read or heard them mentioned in my researches in the department to which the above treatises referred to belong.

L. S. RICHARDS.

Marshfield Hills,
Massachusetts, U. S. A., 1903.

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CHAPTER I.

The Philosophy and Construction of Thought.

First, it will be necessary in the study of this proposition to analyze thought—find its bearings and see how it is constructed and operated. When we visit Edison's phonograph we not only admire the mechanical and automatic conversations which are carried on by it, but are slow to leave the wonder without learning something of the instrument through which the sounds are produced. So with thought. We must first become familiar with the construction of its instrument, the brain, through which it manifests itself, before we examine the phenomena of thought *per se*. The three most important divisions of the brain are the cerebrum, cerebellum and the medulla oblongata. The cerebrum is the upper portion, and divided into two hemispheres: one on the left, the other on the right side of the head. This portion of the brain

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is more especially the instrument of thought. The cerebellum, which is immediately below and back of the cerebrum, and well covered by it, is used to regulate the voluntary and instinctive movements of the muscles, and is partially the seat of reproductive propensities. The medulla oblongata is the continued upper prolongation of the spinal cord, and runs into the central portion of the cranium. It is located in the lower portion of the head, and is the center of all movements concerned in the acts of respiration and deglutition, or swallowing—the two most important requisites in the continuance of our earthly being. These centers, however, are not operated by their own volition, but by reflex action, an involuntary movement. We observe this when we breathe and swallow; there is no thought or will exercised in the performance of either. We do both unconsciously without a moment's thought. They work of themselves, the same as in the act of passing into sleep; we can arrive at that condition only by withdrawing ourselves from thought, and it is done so silently and thoughtlessly that we

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know not when we pass into it. How different are the workings of this portion of the brain from those of the cerebellum! When we lift our arm it is a voluntary movement; our will is exercised; we cannot raise it without thought, although we may often be unconscious when the latter is used in the movement. The cerebellum is the seat of all voluntary movements of the muscles, and in all animals below man belonging to the vertebrates, it is more largely developed than any other portion of the brain. It is the animalistic portion of the head; and the cerebrum, or the upper division of the brain, lessens in size as we pass from man through the lower orders of the animal kingdom. In man the cerebral hemispheres, or cerebrum, reach their greatest development and size, and here the intellectual faculties give a vast display of thought, as manifested in varied and graded forms. Another portion of the brain, the fourth and last division, but not the least, is the tubercular quadrigemina and other ganglionic masses, situated at the base of the cranium. They are connected with the nerves

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of special sensation, and correspond to the ganglions of some lower orders of animals in which is seated the sense of smell, of sight and hearing, and constitute in these animals the principal portions of the brain. In man, as well as in all animals, it is supposed to be the seat of the emotional and instinctive faculties. The question now arises, How does thought operate upon the brain? First, we will commence with its lowest form—that prompted by sensation. Up and down the spinal cord there are ganglia of sensation, upon which all sense of feeling is registered by impressions being made thereon. This principle is illustrated in the recently discovered phonograph. It was thought years ago that words spoken in a room or hall were impressed upon the walls; but this in the minds of the masses seemed hypothetical, and the idea never took root. But to-day Edison has proven, through his little instrument, that this hypothesis was true; for the words articulated in a room, striking a disk in place of the walls, are not only shown to be impressed thereon, but the little instrument—the phonograph—

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repeats word for word, and not only the words but the tone, high and low, soft and loud, spoken by the speaker. The impressions made upon these sensory ganglia are similar, though less marked in degree, to the inverted impressions made by an object seen upon the retina of the eye of an ox immediately after he is butchered. It was given in evidence in a court of justice in Italy, where a man was on trial for murder, that the image of the murderer was impressed on the eye of the man murdered while the arm of the accused was raised in the act of stabbing his victim with the stiletto, the image being so plainly stamped on the victim's eye it could be readily seen and led to the murderer's conviction. These ganglia of sensation have posterior and anterior roots, and sensations are transmitted from the skin, or any portion of the body, to the posterior roots of these ganglia or nerve centres in the spinal cord, and impressed on the registering ganglions, and then pass up the sensory tract (a system of nerves of sensation) in which is deposited a gray matter, and thence to the brain. The

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anterior roots of these ganglia are the roots of motor nerves, and after the sensation has passed up the sensory tract to the brain, the motor tract (a system of nerves) receives this sensation and conveys it down the ganglia or nerve centers, and is there transmitted to the spot in which the sensation originated, and if an injury, pain is felt. These sensations may be the result of some injury to the body, or sensations of pleasure, or they may be sensations resulting from the action of thought; all are, nevertheless, registered upon the registering ganglions; and these impressions stamped upon these ganglions, as in thought registerings, remain impressed thereon for years, and reappear or reproduce themselves strangely at times in our dreams, or unconsciously at other times in our passive meditations. The sensory tract conveys sensation to the back portion of the brain, where the feelings and the animal propensities are seated, and the motor tract passes into the front portion of the brain, where the intellectual faculties are located. These tracts meet in the brain. If the sensory nerves or tracts

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be severed no sensation below it will be felt; all feeling in that direction ceases; but the motor tract is unimpaired, and conveys the motion. Let the motor tract be severed, and it destroys all motion below it; one cannot raise his foot or arm but the sensory tract or set of nerves is disturbed thereby, and the sensation is felt the same. The two tracts are independent of each other, yet operate, perhaps, together for the attainment of the same object. The spinal cord in the infant extends down to the sacrum, or the lower part of the vertebra, while the upper portion terminates in the brain; in fact the cerebrum, the cerebellum and the medulla oblongata are simply the extensions of the spinal cord. In the adult the spinal cord does not extend down to the very lowest portion of the vertebra, but extends farther upward and develops into the cerebrum, or the intellectual lobes of the brain. As the sensory ganglia scattered through the spinal cord is the register on which all sensations or feelings are impressed, so the ganglia or grand sensorium in the brain is the store-house or record-book in which the

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higher feelings, developed into intellectual thought, stamped and stored to be brought out and used, perhaps to-morrow, next year or years in the future, as circumstances arise to recall it. I am well aware that every particle of matter, it is said, that existed in the body seven years before, has wasted and passed away, and it would seem that the ganglion registering sensations, with the impressions, passes away with it. The ganglion does probably waste and disappear, but the process, the new taking the place of the old—is so very gradual that the stamp, the impression, the form, remains thereon—the same as a scar on the body remains unchanged for scores of years, or for life.

Does thought begin in man? We will pass down the long chain of animal life, commencing with the lowest forms and work up and study the development of thought. Beginning with the protozoa, the lowest form of animal life, to which sponges belong, we find no trace of thought, simply because there is no receptacle, or brain, through which it can make itself manifest. Nature always adapts

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means to ends; and if there is a use or demand for any faculty or property, an instrument or organ is gradually fashioned through which it can be exercised. If on the other hand, any organ of the body ceases to be used or exercised in the course of many generations, the organ dwindle^s away, and is lost. Passing to the next order in the animal kingdom we come to the radiates, to which star fishes, jelly fishes and the polyps, or coral builders belong; and do we find thought manifested in this order? It might be argued that the beautiful forms of coral, the mammoth coral reefs, the large islands of coral built by these polyps exhibit some traces of thought; and yet when we study into their habits, we find that coral is simply the secretions of this animal, the same as guano mountain deposits in Peru are dropped by the birds soaring among the Andes. The mode of sustaining life among the polyps by throwing out its circle of feelers and taking into its mouth that which happens to pass within its reach, exhibits that want of energy and thought manifested in the higher animals; and among

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the various families comprising the order of radiates the same absence of a receptacle or brain for the exercise of thought is as apparent as in the protozoa, the lower order heretofore described. So low are these animals in the scale of creation that they are blessed with only two important organs, and those are the mouth and stomach, (a simple sac to receive the food) and the waste passes out of the body at no particular place, but here and there, wherever it can find vent.

We pass now to the next order in animal life—the mollusks, or shell animals; do we find thought, in any form, displayed in this order? Take the clam or the oyster with which the masses are most familiar, and how imperfectly developed are they! A lump of flesh, with but few organs, no evidence is manifested of a receptacle, or brains for thought, nor the least manifestations of it in their works. Next in the order of the animal creation comes the articulate, which includes the worms, insects and spiders. In the works of these animals there is certainly some skill and ingenuity displayed, and here

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begins our study of thought; here is seen the rudimentary manifestation of thought undeveloped, and here for the first time in our researches through the lower orders, do we find a receptacle, or brain, for the exercise of thought.

We call it thought, although it is hardly worthy the name in comparison with the thought manifested through the brain of man. It bears the same relation to the latter as does the simple and shapeless oyster to the complex man, in belonging to the one great family which characterizes the animal kingdom. Although we find a brain in the articulates, yet it lacks one of the important divisions which gives man his superior intelligence—the cerebrum, or the upper hemispheres of the brain; and the works and labors of these animals are what one might expect from such an organized brain. The bee that exhibits such wonderful mechanism, such ingenuity in its movements, such rules of government in its colony, is, after all, largely automatic in its labors. The bee cannot, like man, or even the horse or dog, be

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educated; it is no further advanced or developed than it was one or two thousand years ago. The same is true of the spider. And yet when we look at the labors of the tarantula, the ingenious spider that builds its nests in the ground, the interior of which is a fine piece of masonry and as smooth and polished as the walls of the finest house around us, the material consisting of fifteen layers of silk, and as many layers of clay, laid alternately, with a trap door ingeniously made, (a hinge on the back of it, and the door smoothly beveled to fit the entrance perfectly) these works, as I viewed them in the mountains of Sierra Nevada, impressed upon me a feeling of admiration for the genius displayed by these not altogether lovely, but death-stinging insects.

Nevertheless this ingenuity existed a thousand, or thousands of years ago, no improvement has ever been made, and doubtless never will be by them; this is instinct; a manifestation of thought nevertheless, and in some instances perhaps a feeble attempt at reason. Instinct is that part of our intellectual being,

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and of all animal creation (save the few lower orders) that is not susceptible to development or growth, but remains nearly the same through all the species, and for all time, save perhaps in some rare cases in individual movements, while reason is that property in animals that can be, and is, improved or developed. A dog searching for his master comes to two roads which make an acute angle; not knowing which one to take, he stops and looks about. If he were governed simply by instinct he would not hesitate a moment, but take one of them instantly, unhesitatingly, the same as a bee a long way from home strikes a straight line immediately, unhesitatingly for its hive; the dog, however, in the absence of any direct knowledge as to his master's whereabouts is obliged to stop and think. Possibly a previous experience in choosing the wrong road has taught him to be more cautious; and this time he stops to reason, and considers the point—which road the master would be most likely to travel; he has lost the scent, and finally after mature deliberation he takes the road he thinks is the right one, and

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goes in search of him. The chief promotor of reason or thought is experience, and when an animal possesses the instrument, the organ, which is the cerebrum, in which thought can be exercised and developed, then reason crops out above instinct. But in the articulates the cerebellum is the highest division of the brain, and here is the seat of instinct. We must call it thought, although it is the lowest manifested form of it; and here we will divide thought into two parts, or forms: instinct and reason; instinct being the lower form, undeveloped and uneducated, while reason is the higher, and susceptible of improvement or development. Instinct works as though governed by reflex action, the same that operates our swallowing and respiration—an automatic, unconscious movement, in which our volition has but little part. We breathe because we cannot help it. No amount of will left to itself can stop it. Having found that thought in its lower form, instinct, is manifested in the order of animals called articulates we shall leave the bees, spiders and worms to enjoy their rudimentary shadow of

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intelligence as best they may and pass on to the next order of animals called the vertebrates, or those having a backbone, of which man is a part and parcel. To the ordinary observer it would at first appear that the lower animals of this order are almost entirely destitute of thought, and, instead of being placed higher in the scale of animal creation than the bees and ants, they should be placed lower; for the thought manifested in the latter, through instinct, is certainly higher than the apparent absence of thought in the fishes. But this is erroneous, for these creatures of the watery deep do possess thought, and it is brought out when properly induced. Some years ago a little girl residing in one of the rural districts upon the South Shore, not very far from where I lived, became interested in fishes, and every morning visited a small river which flowed through the town of Hingham. After throwing crumbs to these creatures every day, she at last succeeded in calling them up near the shore to their breakfast. She soon became famous in that region, and people far and near called to witness her re-

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markable power in this direction. Multitudes of fishes would obey her call to the shore as quickly as a dog answers the call for his dish of meat and quicker than most cats for their daily meal. This it must be perceived is a step beyond instinct, it is thought, educated and trained. The fishes were educated into the belief that her call meant something—something to satisfy their hunger; and off they rushed to the shore to obey it. This I am aware is a low manifestation of thought; and yet how many of the “lords of creation” rise much higher than answering calls to satisfy the wants of the stomachs? The ants, governed by instinct, would not respond to such a call. We will next advance a step to reptiles. Rev. Thomas Hill, ex-president of Harvard college, tells the following: “While observing a toad which made itself at home around my front door step, I found it struggling in the attempt to swallow a large grasshopper; it succeeded in partially swallowing the front portion, but the insect was too long, and the hinder portion protruded from the reptile’s mouth with but little prospect of any

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further progress in passing down the valley of death through the throat. The toad realizing its critical condition, bent its head towards the ground, and endeavored to push it down the æsophagus, but after repeated and unsuccessful attempts, the trial was given up, the angle being so small that there was not purchase enough to crowd it down. The toad, however, was master of the occasion, and at once raised its hind legs, thereby making a greater angle; (nearly perpendicular) and thus the insect was easily pushed down the broad highway leading to the stomach. On another occasion this toad experienced a similar struggle with a large earth worm. It succeeded in swallowing about three-fifths its length, but at last, through fatigue, it could not swallow fast enough, and the worm succeeded in crawling out of the toad's mouth faster than the latter could swallow it. At last the reptile used its wits, and with its forward feet clenched its own throat, and held the worm fast, while it succeeded in swallowing another inch; then clenching the throat again, and holding it firm in its grip until an-

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other swallow was made, it finally succeeded in devouring the entire worm. Here is a manifestation of thought" continues Ex-Pres. Hill, "higher than instinct; for through experience the toad found that no regular or ordinary methods would apply in these cases, for its peculiar situation demanded extra exertion and thought to secure its prey and find relief."

Passing on to the next higher order in animal life we come to birds. Here we find the brain a little more highly developed. The cerebral hemispheres are yet small, the cerebellum being much larger. Many of the domesticated birds exhibit at times considerable thought when called out. We see this, in a low degree, in the ready obedience of hens, ducks, etc., to the call of their keeper, while greater development of thought is manifested in the trained canary bird and the parrot. The next higher order of animals comes the quadrupeds; and here a more highly developed brain is quite apparent, and consequently a higher grade of thought is found. The dog is perhaps as high a representative of this

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class as any, and its intelligence is, I think, largely due to its intimate association with man. Wherever man is found on the face of the globe, there the dog is also. The intelligence of man is undoubtedly imparted in a low degree to the dog. Through countless generations his brain has been developing by means of this intimacy until now a dog that fails to manifest some thought in his movements is pronounced worthless. Instinct is a large factor in a dog, but it is not by any means the only factor. Reason crops out here and there in a thousand remarkable incidents which are familiar to most men.

The cerebrum is larger in quadrupeds than in the lower order of animals, but the cerebellum and the medulla oblongata are by far the largest portions, and furnish a much lower order of thought, because animalistic in its make-up. The brain in some quadrupeds is larger and heavier than that of man, but the size is no indication of the amount of thought it is capable of producing. For that we must look to the portion of the head in which the brain is situated; if in the back and lower

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portion, where the cerebellum lies, as in the quadrupeds, and lower orders, there less thought is displayed; but if it lies largely in the upper portion, or in the cerebrum, as in man, there thought has full sway; while the amount varies in different individuals in proportion to the shape of the cerebrum, or the cerebral hemispheres, and the quality of the brain mass therein contained. Our next step is the consideration of thought manifested in the quadrupeds, which includes the apes, baboons, monkeys, etc. Here I shall not attempt to prove that the thought of the ape is any more identical with the thought of man than is the thought of the lowest Hottentot with that of Herbert Spencer. Nor is it my purpose to compare the general structure of the quadrupeds with that of the bimana—man. To the brain we look for thought; and what do we find? The ape is the highest representative of the quadrupeds, but its skull exhibits a very small receptacle for the cerebral hemispheres. The frontal portion of the head, so conspicuous in man, retreats backward in the ape, and hence the back brain

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or the cerebellum predominates in these creatures. The quadrumana, however, is a long step in advance of quadrupeds, both in the structure of the cranium and brain, and the quality of thought. We see this in the ordinary monkey traveling in our country towns with its bosom friend, the organ-grinder. It fills the office of treasurer by passing around its tiny hat among the crowd to collect funds sufficient to please its master. It is anxious for a cent, and will work as hard for one, as most of its superiors whom we call man. It is said that no animal but man can use tools or weapons for defence. Monkeys, however, are known to open boxes, and baboons, when traveling together in large numbers, will attack men by throwing stones at them. Apes, when domesticated, sometimes use knives and forks at the table in eating their meals, with the ease of man. One is described as making his own bed, carefully and smoothly laying out the clothes, and borrowing or imitating some of the evils of its superiors, it stealthily passes into the chamber of its master and draws out a nice blanket from the

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made up bed, runs off, and places it on its own, showing conclusively that he is equal to man in his appreciation of a good bed. This ape lived in the house with the family, and its habits and manners were like those of a child. All it appeared to require to perfect its accomplishments was articulation, or speech. In Paraguay there are monkeys that can utter five distinct sounds to express their varied emotions and feelings. The apes in their native haunts, use a language among themselves. When traveling on a foraging expedition into an African village, the main body of them will keep a little back and allow the scouts to go ahead; and if any danger is apparent they sound an alarm, and the pickets will beat a hasty retreat. Thought may be further divided into three parts: Intellectual, moral and animalistic. The latter is common to all animals, from the spiders upward, and is confined to the cerebellum and the medula oblongata, while the moral is seated at the top of the cerebrum, near the crown of the head, between the intellectual and animal faculties; and the shape of the cranium in the

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monkeys, running comparatively high from the ears to the crown, indicates a fair amount of morality. Some time ago a keeper entered a cage in which were kept a baboon and a monkey. Through some unexplained cause the baboon attacked the keeper and would have dispatched him in a short time had not the monkey, through its generous and sacrificing nature, attracted the attention of the baboon toward itself by its cries and bites. The keeper escaped, but the poor monkey paid dearly for its generosity. The affection of some monkeys for their young is very great; at the death of their offspring some mothers have been known to mourn themselves to death over the loss. The intellectual faculties are active in some. An inexperienced monkey will place an egg on the ground, take a stone up into a tree, and let it fall on the egg to break it. The egg scatters and is lost on the ground, and the monkey gets but little. He does not repeat this operation a second time, for the experience of the first has demonstrated the fact that none of the yolk can be obtained by this method. Hence

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his reason (the outgrowth of experience) dictates to it the second time not to go up into the tree, but to crack the shell of the egg gently with his hand and save the contents.

Although the thought manifested in the quadrumania is in advance in quality above the quadrupeds, yet it is far inferior to that manifested by man; for the lowest barbarian on the face of the earth exhibits qualities of thought superior to the highest quadrumania. The barbarian, however low, is master of the most powerful quadruped. He hunts the lion and the tiger, and through his genius succeeds in conquering them. He constructs a hut close by the dead carcass, kindles a fire, dresses the meat, and cures the skin to throw over him; while no single quadrumania ever attacks a lion or tiger, constructs a hut for shelter, dresses meat, cures the skin, or kindles a fire to keep him warm, although apes have been seen warming their hands over the fire hunters had left, and mourning over the expiring embers, but not manifesting sufficient thought to throw wood thereon and keep the fire alive. The nearest imitation to man

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in dress is in placing mats, made of leaves, upon their heads, and sometimes covering the body with leaves when lying down to sleep. We do not discuss in these papers whether man, the bimana, is an outgrowth of the quadrumanes or not. What we want to follow is the line of thought running through the various orders of the animal kingdom. Since leaving the articulates, or the bees, spiders, etc., we find that instinct is being gradually developed into intelligence or reason. Instinct still preponderates, in all orders of animal life below man. We come now to the brain of man, through which thought makes itself manifest. If the increase or development of thought is in exact ratio to the increase or size of brain mass, we should expect to find in the whale, which has a brain nearly twice the size of man, a corresponding increase in intellectual power. But instead of finding double the intelligence that is displayed by man this monster of the deep scarcely touches the hem of thought emanating from the brain of even the lowest races of men; and the same is true of the elephant and

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other animals containing a greater amount of brain mass than man. This simply demonstrates that it is not the quantity of brain mass that makes the thought of man superior to the beast, but the quality. On examination, the interior brain mass of these animals and man, a great difference is found in their composition and shape. In the lower animals the outside of the brain is comparatively smooth. No unevenness to speak of is discovered upon them until we arrive at the rodentia, which includes the rats, squirrels, etc. Here the smoothness of the surface is first disturbed; rudimentary foldings or convolutions are seen, where a small portion of the surface is folded slightly over; and the number of these convolutions or foldings, increases from these animals to the highest orders below man. But even in the highest of them the foldings are few and inferior, and simply feeble attempts to imitate the convolutions which, in the brain of man, are multitudinous. In removing the upper portion of the skull of man a very peculiar and beautiful arrangement of the surface of the brain is observed. The

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folding or convolutions mentioned above remind one of the great canyons of Colorado pictured upon canvas. Deep gorges are seen here and there, winding throughout the surface of the brain, and leaving but small, narrow surfaces to keep the skull propped up. These convolutions are covered with a gray matter, and this matter is the medium through which thought is manifested. The more numerous the convolutions, with their deep gorgings and windings, the greater will be the amount of gray matter deposited on its continued extended surface, and the higher the thought displayed. Like the coasts of our continents, the greater the crooks, the inlets, the bays and gulfs, the more extended is the coastline; and a corresponding increase of seaport furnishes a country with unbounded facilities for commerce. And just to this extent does a nation grow and become more enlightened and enterprising, as we see illustrated in the remarkable growth of North America and Europe. Could the gray matter deposited on the surface of the numerous layers and convolutions of the brain be spread

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out on a smooth and even surface it would occupy about 660 square inches. And yet this large extent of matter through which thought undoubtedly operates is stored away in the small space occupied by the brain mass. It is not so surprising in view of these facts, that our thought is so extended and memory so expanded. The convolutions are mostly found on the top and front portions of the brain or cerebrum. In the cerebellum, the layers do not possess the depth of the convolutions contained in the cerebral hemispheres. In the brain of children there are less convolutions, and a corresponding decrease of gray matter. Instinct is a greater element in young children than reason, and it is not until the brain increases in size, with an increase of the number of convolutions and the gray matter deposited thereon, that we can look for a greater display of reason than instinct. The lowest races of men are known to possess fewer convolutions and less varied than the most intellectual portion of mankind. If thought lacks the instrument through which it can make itself manifest, it must remain at

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rest. The barbarian has not the quantity or quality of brain to make him think intelligently. The front portion of the cerebrum where the convolutions and gray matter is largely found, is somewhat lacking, as the backward slope of the forehead indicates. The same slope is more conspicuously seen in idiots, and more or less in almost all unintelligent persons. A great person, intellectually, generally possesses quantity and quality of brain mass in a large degree. In a small head, whose numerous convolutions are varied and deep, with a thick deposit of gray matter upon them, which is often the case, we shall find greater intellectual power than in a man with an overgrown head (as some I have seen) whose convolutions are symmetrical and the gray matter thin with probably a considerable amount of water to fill up. Hence, although phrenology is undoubtedly in the main practical and correct, yet the true estimate of intellectual power cannot be accurately given until the cranium covering the brain be removed to detect the condition and quality of the brain enclosed heretofore described. In

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speaking of the quality of the brain we do not mean the chemical analysis, as in the analysis of a cabbage to find its chemical properties. It concerns us not whether it contains more or less potash, albumen, or phosphorus, to give it intellectual power; these have to do with the health only of the organ. It is well known, I am aware, that phosphorus is an important chemical property of the brain, and the thoughtless conclusion is arrived at by some that by eating a liberal amount of fish, which contains a considerable quantity of phosphorus, one will increase the brain power; but this fallacy cannot be dispelled more quickly than by a practical illustration of the fisherman. None live more upon a fish diet than this class of people; but do they or those living upon the sea or by the sea, manifest greater intellectual power than those having less opportunities to live upon this kind of diet?

The question now arises, how does thought make itself manifest when the brain and the body are apparently at rest during the hours of sleep? In the hospital at Montpelier, many

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years ago, there was a young lady whose brain was partially exposed—the result of a terrible disease which caused the loss of a portion of her scalp, skull and dura mater. A rare opportunity was offered to study the operations of thought upon the brain mass. During profound sleep her brain was comparatively quiet, and remained motionless inside the cranium; but when she dreamed, the brain mass began to move and protrude outside of the cranium. When her dreams were the most active and exciting, (as she afterwards stated) the brain was most disturbed and the protusion was greatest. So was it during her waking hours; when engaged in lively conversation, the protusion was the greatest. Outward applications to different portions of the body directs the train of thought in our dreams. A patient placed a bottle of hot water at his feet after getting into bed, and dreamed that he was traveling on a volcano and found the heat unbearable; another one applied a blister to the top of his head, and dreamed that the Indians were scalping him. A man half-asleep and half-

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awake imagined a person in his chamber, with his hand placed upon his shoulder; he became frightened and dared not move. On fully awaking, however, he found that the sole cause of this peculiar feeling was due to the shoulder being uncovered and bare, causing a chilliness there, which felt like a man's cold hand. This leads us into the inquiry of the condition of the brain and operation of thought during sleep, made manifest through dreams. During profound sleep the cerebral hemispheres, or cerebrum, are perfectly quiet; but the medulla oblongata, or the lowest brain, is active, or at work. This is evident because respiration, or breathing-power, has its seat in the lower brain; as breathing is indispensable to life, we breathe the same at night, while sleeping, as during waking hours. The cerebellum is more disturbed in most dreams than the cerebrum, simply because in the former the instinctive and animalistic faculties are found. And our dreams are generally of a low order of thought, and unreasonable—just what we might expect to proceed from an inferior portion of the brain, as is the little

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brain, or cerebellum. When reason is the largest factor in our dreams—when difficult problems are solved, and philosophic, scientific thought is displayed—the cerebrum is exercised. We will now consider the cause of incongruities, the disassociation of ideas, the ridiculous manner and impossibilities displayed in the arrangement of thought in many of our dreams.

The brain is divided into compartments, or organs, and each compartment has a special function to perform. Some of the organs are inactive and in profound sleep, while others are awake, and at work. Now in sensible and reasonable thought all the faculties are active, and are intimately associated with each other; each and all must blend, cooperate and harmonize completely with one another. While in dreams that are absurd, ridiculous and unnatural, all the faculties or organs but two or three are asleep and quiet, and the organs or compartments that are awake are left to themselves; and like a horse guided with but one rein, they perform peculiar gyrations and make but little progress in the path of

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well regulated thought. Thought made manifest in dreams rarely considers or comprehends time or space, and hence friends who departed this life years ago are made to appear alive and natural, and events which have never had a reality or an existence appear real and unquestionable in dreams. In our waking hours we bring time and space to bear upon our thoughts, and thus dispell all incongruities, or contradictions, that appear so reasonable in our dreams. We bring our volition into action during our waking hours, and muster the forces which all of our faculties possess, when thinking upon any question; but in our sleep we lose control of the will. Our thoughts manifested through dreams are involuntary, and we cannot bring forward this and that faculty to bear upon the subject through the will, as we can in our waking hours. But it should not be understood that our volition must be powerless before we can fall asleep; for it is absurd to suppose that any amount of will one possesses can stop wholly its operation, any more than one can directly lift himself from the

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ground by his boot straps. He may be, and is able to change the direction of his thought; but to stop the action of his will before passing into sleep is impossible. Our dreams are generally made up of events that are most recent. Any narrow escape from some alarming accident during the day will, very likely, occupy our thoughts through dreams at night; and at the most frightful point in the dream we startle and awake. Our will is at once exercised, and our reason with lightning speed is brought into action, and in a moment the inconsistencies and absurdities are made apparent. The cause of this sudden awakening is unquestionably due to the great pressure on that portion of the brain severely exercised by such stirring thought as fright produces. This we see illustrated in the movement of the brain of the young lady heretofore mentioned, where the brain largely protruded from the opening of the skull when she was experiencing any excitement. Hence the pressure on the skull in such startling dreams must be great enough to awaken the sense of feeling, as the pricking of the body by a pin startles and awakens us.

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Nightmare, delirum tremens, spring from one common parent, and are nursed by the same hand. Each and all are manifestations of thought proceeding from a disordered organism, but arising from a different cause. The nightmare is a frightful dream, and caused by the unhealthy action of the stomach. Sometimes on retiring to bed, the food has not sufficient time to digest before sleep overtakes us; and again, through no want of time, but through some disease of the stomach, food cannot be digested. When we lay our bodies upon a bed and pass into sleep, the heart becomes more quiet, the blood consequently circulates but little, and very slowly, and the contraction and expansion of the stomach, with the involuntary movements of the hair-like villi surrounding the inner coating of the stomach, and the flow of gastric juice from the gastric glands therein, which all together contribute to the digestion of food, to a great extent partially cease, giving the over-worked stomach, for the time being, a load upon it which is difficult to master. This disturbed feeling is

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conveyed to the brain through the pneumogastric nerve, which excites into action the organ of the brain most easily disturbed; and that is the organ of fear. What attribute of thought, what distinctive feature of the mind is more common or prominent than fear? It is continually operated upon in one way or another, morally, socially and physically. A lack of combativeness or destructiveness, even, is not a proper substitute for fear. All nightmare and delirium tremens appeal to no other organ more than the organ of fear. The cerebrum is not much disturbed by nightmare, for this affection of the brain is very unreasonable, and belongs more to the animal portion of our being than the intellectual. Often have I dreamt of dodging and jumping over countless number of enormous snakes; the ugly serpents giving me chase; and numerous attempts to hide and escape from robbers and murderers on my track, which excited an intense fear; then I would suddenly awake at the very moment the pursuer had almost secured me as his victim, to find it was all a dream; and at times my

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body was so completely at rest, so death-like in its action, the heart so motionless, and all the internal movements so nearly suspended, that for a few moments after completely awaking, I could neither stir hand nor foot, nor start to life again and give motion to my prostrate form, except by attempting to move my little finger, and in this manner gradually sending the shock through my frame, and setting my body in motion. Delirium tremens operate upon the mind in a manner similar to nightmare. In becoming the receptacle of alcoholic drinks the stomach becomes diseased; this in turn affects the pneumogastric nerve, and disturbs the brain not only in sleep, but in waking hours. The organ of fear is excited, as in nightmare; the victim believes he has fallen among snakes and the most hideous beasts imaginable. Even the horrors of hell are pictured before him; and at times the poor sot finds no relief until death puts an end to his fiery imaginations and experiences. The old doctrine of hell-fire, now nearly obsolete in the minds of most people, literally speaking, owes its existence to an unbalanced,

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mental or physical organism. It may not have proceeded as with nightmare and delirium tremens from a diseased or disordered stomach, and yet we would not say that it did not. But be that as it may, the same organ of fear in the brain was excited, a God of wrath, with a lake of fire and brimstone for his erring children, pictured to the imagination for centuries, developed the organ of fear, and crazed the brains of millions of people with the nightmare of superstition. That craze is now numbered among the delusions of the past, and God is now a God of love and no longer a God of fear, or God of wrath.

Thought is sometimes semi-conscious, as in somnambulism; this is the nearest to the waking state of any of the phases of sleep, and it often happens that in this state a person can perform more dangerous and daring feats than when wholly awake, because his mind is not disturbed by outward things and surroundings. When for instance a somnambulist walks in the night upon roofs, and upon high, narrow and precipitous places, he is not aware of the danger, as when awake,

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and hence can balance himself with much greater ease. In this case double consciousness sometimes occurs; that is, events in the imagination of outward things fill the mind of the somnambulist, and, immediately after, thoughts of the inner, intellectual man follow. Neither condition has, in its separate state, any recollection of the other, and hence, on waking to entire consciousness, it seems that two separate lives have been passed. From time immemorial the belief has been prevalent with some that dreams often indicate forthcoming events; but there is nothing in the structure of thought that can substantiate the proposition. Nevertheless, we must not be blind to the fact that by them events have frequently been foretold. The wife of Julius Cæsar dreamed, the night before his assassination, that her husband fell bleeding across her knees. Persons have saved their lives by being forewarned in their sleep of some accident which would occur on the following day to the party they intended to join, and thoughtfully remaining at home to avoid the danger. That thousands upon

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thousands—ay, millions upon millions—of events occur which are not forewarned or foretold makes it possible that one thought in a million or billion might, through the boundless wanderings of the mind in dreams, accidentally hit upon an event, or train of events, corresponding to some actually occurring in the near future, but which would pass into oblivion (as they do every night) and be entirely forgotten if the millionth or billionth chance did not accidentally happen to come to pass.

Is thought the product of the brain? Let us investigate the phenomena of thought a little further before we give an answer. To the question, Why should thought be so seriously affected when the brain becomes diseased? the reply is often given that if thought were immortal and independent of the body it would not be weakened by any defect of the brain mass. If the instrument or organ through which thought operates is injured or damaged, as in a cornet, how can a cornetist play, or thought play upon, or operate the brain? Persons become insane through some

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disease of the organ by which thought makes itself manifest. Generally only a portion of the brain is diseased; and in insanity it operates in many cases, the same as in frightful dreams, nightmare, etc. Here we are aware that the incongruity, the unreasonableness of thought exhibited is due to the disassociation of ideas. The diseased portion is unhealthy in its action; like the loss of a spoke in a wheel, it unbalances the whole, and is of but little use to us. Good, well-developed thought requires the harmonious action of every portion of the brain; and each and every organ must be active and blend with one another, as the white light from the sun requires the presence of every color in the prism to perfect it. Our answer, then, must be that thought is not the offspring of the brain, but that the brain is the machine, or instrument, the only instrument through which it is possible for thought to make itself manifest. Could our eyes be made sufficiently microscopic, with a magnifying power far surpassing anything man has ever produced, to examine an active brain exposed to view, it is my belief that the results

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of thought in its multitudinous ways, could be seen operating upon the brain, in all its varied portions, as apparently and with as delicate a motion as does wind upon the reeds of the organ, which through the fingers of a Mozart touching its keys, sends rich tones through cycles of time to the ears of the civilized world, or the receiving plate of a telephone, in catching the delicate sound waves emanating from the speaker, and their transmission through electrical action over a wire hundreds of miles distant. Because a portion of the brain becomes diseased, and the harmonious working of thought is consequently disturbed, it furnishes no evidence that thought *per se*, is not an independent power behind the brain. Steam, and electricity which sends the iron horse over the network of railways spanning the continent, is invisible, but its great power is felt throughout the length and breadth of the land. Is steam or electricity the product of the locomotive, or is the locomotive merely the instrument through which invisible steam or electricity operates? The brain is the servant of

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thought, and if the former is deficient in size, in shape, in quality and harmony of all its parts, the display of thought will be correspondingly weak. Take the brain of an idiot, observe its shape; the backward slope in frontal portion indicates a small cerebrum, especially in that locality where the reasoning and intellectual faculties reside. Thought—intellectual thought—is here deprived of an instrument through which it can make itself manifest; and yet this portion of the brain is capable of development. One-half of the idiots who enter institutions for the idiotic between the ages of five and twelve graduate with the cerebrum developed, and an increased intellect sufficient to obtain a livelihood and perform the ordinary duties of life. Does not thought lie dormant in the brain of an idiot, awaiting the perfection of an instrument through which it can unfold itself? A pint bottle cannot contain a quart of water. A very great man intellectually, always possesses a well formed, and good sized head, and especially prominent where the intellectual, reasoning faculties lie, and he could not

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be intellectually great unless the instrument through which thought operates was well built and adequate to perform the task devolving upon it. A small, ill-formed and poorly equipped instrument could never do it.

Let us now give a little more attention to the composition, construction and effect of thought. What is thought? The spinal cord and the brain contain, as before mentioned, registering ganglia on which are impressed sensations of pleasure or injury to the body and conveyed by the sensory tract to the registering ganglion, and stamped thereon. Sensations resulting from the action of thought are impressed or stamped on the grand sensorium in the brain; that thought stamped on these ganglia in early childhood, and recalled and repeated in old age, proves the truth of this long established hypothesis. Granting its correctness, it requires something more than an imaginary, shadowy something to stamp itself upon a ganglion, or any form of matter, and retain the impression for scores of years. We can readily understand how speech impresses and stamps itself on the

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disc of the telephone, for sound causes a vibration of the air through which it passes, and on reaching the telephone stamps its impressions thereon. This is accomplished by a force called motion. If thought is a substance, as one writer claims, it must possess a force behind to stamp or impress it on the ganglia, and that is certainly beyond our conception. Our thoughts are largely made up of impressions recorded or stamped upon the sensorium. Recall all the thoughts possible emanating from the brain within the past twenty-four hours, and it will be noticed that most of them occupied our thoughts before, some of them concerning events of the past and similar events to come. They have been stored away in the brain for future use, like the ruminants who eat grass or hay, store it away in one of their stomachs, while at their leisure they bring it up and chew the cud. These events or occurrences are stamped on the sensorium in the brain; they are evolved in our mind, and we think of them over and over. Now these impressions which constitute a portion of our thoughts, being stamped

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upon the sensorium as tangibly and as really as a figure head is impressed upon a silver coin, must necessarily perish when our body dies. But there is something behind the impression that is stamped on the brain, the thing, the force, the power we call thought exists above, beyond and outside the stamped impression, it is independent of it, as much so as the thought that sets the printers type and impress it on the newspaper; the newspaper decays and the stamped impressions with it, but the thought lives and lives independent of the impressions stamped on the newspaper. It may be well said that all of our thoughts are not recalled from the sensorium and given out second hand, but that a portion are original, new to us, and enter the brain for the first time and stamped on the sensory ganglion. Very true, and notwithstanding most of our thoughts original with us are what the eye sees or reads, or the ear hears, and through the nerves of special sensation receive the outward sensation and conduct them to the sensorium upon which they are stamped, yet there arises in the minds

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of men thoughts which are new and original, and have never before been brought out. If not, what becomes of our boasted advance in civilization, of our progress in the arts and sciences? Where do we find in the history of the distant past, the thought that harnessed the electric spark, and drove it around the world? Where the thought that bottled up steam and electricity in iron bands, and sent them flying upon the rails, dragging across a continent coaches filled with human beings? And where the thought that discovered a process by which words wasted upon the air could be caught, and by their own weight and motion in the passage, be stamped upon a piece of metal, and ages after ground out and repeated in the same tone and the same words of the original, spoken years in the past? These thoughts could not have been previously found upon the sensorium or the ganglia in the brain of any living man, nor could the objects of these discoveries have been impressed on the ganglia, or nerves of special sensation, for the objects or discoveries had no existence.

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Whether the spirit released from the body possesses the power to copy it, in any manner, from the dead and perishable sensorium, must remain an open question.

We have found that although a large portion of our thoughts are old and stored in the grand sensorium, or more properly speaking impressed thereon, and continually brought out and re-impressed again, yet there are thoughts previously explained which are new and never before known to have entered the brain of man, and consequently must have sprung from some source outside of our material body; and, although these thoughts and all other thoughts impressed upon the grand sensorium in the brain, mechanically stamped on matter, must perish at the death of the body, yet the source from which these thought-impressions were made is as much separated from the body, and must be as imperishable and immortal, as is the light from Polaris or the North Star. The form of the Dipper in the constellation of the Great Bear in the heavens is impressed upon our retina, and the sensation is conveyed to the brain

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through the optic thalamus; but the source from which the light which was impressed upon the brain emanated, is distinct and separate from our body, although the impression made upon the ganglia is materialized, and perishes with the body. The question now arises, are the thoughts here gained through study and experience continued in the life beyond? I can see no reason why the disembodied spirit should not have the same power to view its own accumulated thoughts stamped and registered on the registering ganglion or grand sensorium of its dead form laid in the tomb as does the embodied spirit in reading the printed record in a book, as long as either form of matter remains entire and undecomposed. And does it not seem probable that the accumulated thoughts gained in this world are continued beyond the decomposition of the body, remaining individualized by being incorporated into our spiritual being as part and parcel of our individual self, which as I view it must be imperishable, and consequently without end? It is useless for me to speculate in these papers upon the undeniable, un-

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questionable certainties of the forms of development of thought or spirit in the life beyond, for our consciousness or appreciation of every existing force, or form of thought, is weighed, judged and understood through matter, or our material senses. We may reason and philosophize upon the probabilities of the immortality of thought, but when we state that to be true and unquestionable which cannot be demonstrated by actual knowledge, by the aid of the senses, we simply expose our ignorance. Spirit cannot have a full conception of spirit while connected with matter, nor can thought of itself, alone and independent from aught else. Philosophers have divided on the question as to the possibility of any one being able to realize his own existence here in the body; that nothing can realize the existence of anything only by standing outside or apart from it, and viewing it as separate and independent. How can thought realize or form a conception of itself any more than spirit can conceive spirit as independent from matter? We witness the results, the operations, the manifestations of these forces

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through matter, and are consequently obliged to judge and weigh all things through matter as all experience and knowledge upon the earth are gained through it, and can be gained through no other source during our stay in the present earthly form. Notwithstanding we are blessed with reason, and through that alone we must find immortality of thought, I am strong in the belief that we live always, as certain as there is a God in all, throughout the universe, and that thought is ever present and is part and parcel of our spiritual being through all time. As well might one climb to the summit of the loftiest mountain on the globe, and fly in a balloon forty miles into space to find the point where the atmosphere enveloping the earth begins, as to determine where thought commences in the animal creation. It diminishes so gradually from man to the lower forms of animal life that it is impossible to find its utmost limit; and notwithstanding that the articulates are apparently as low as we can trace anything worthy the name of thought, yet I do not hesitate to say that it is possible, ay, and quite probable,

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that every living thing that moves by its own volition possesses thought; for by what other process can it choose its own direction of locomotion? Thought, we found in the early part of our investigations, was divided into two forms, reason and instinct. Reason we found was that quality of thought capable of being educated and developed, while instinct is a fixed, uneducated habit. Man, and in fact all the vertebrates, possesses both instinct and reason. We see this manifested in self-defence, in parental love, desire for gain, and many other qualities common to most animals. With many men, if not the majority of them, instinct is as prominently manifested as reason. They make no attempt to develop thought, but are satisfied with sufficient to eat and drink and leave the world no wiser than their fathers preceding them. For this great want of development in thought we all, I think, are responsible. The duty should be impressed upon the mind of every child born into the world to become better, wiser and farther advanced in intellectual thought than its parents; if not, what becomes of progress

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and the development of the race? The end of most on earth appears to be satisfactorily attained if they can come out of it whole, and leave the world no worse for their having been born. We ape too much the dead past. Our highest institutions of learning in town and city are wasting most of the hours allotted to students in deciphering, translating and memorizing the records of ancient philosophers, orators and statesmen. If we should study Cæsar less, and the present and future development of our race more, the world would be the better for it. If we are not farther advanced in thought than those old Grecian and Roman philosophers and orators there is something wrong, and the past two thousand years have been a blank in the world's progress. As the earth is now supposed to be in its prime, and will soon be in its dotage, the same as all of us who sojourn on its surface, let us look to the present and elevate thought to a higher standard. The brain is ripe for it; it is fertile, and only awaits the seed, which, when planted, will quickly germinate

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and thrive if properly cultivated. More thought is the thing wanted in all departments of life, in the mechanic and in the farmer, in the physician and in the preacher, in the capitalist and in the laborer, in the statesman and in the philosopher, in the teacher and in the scholar, in the parent and in the child.

CHAPTER II.

The Missing Link.

No one can reasonably pretend for a moment that a law exists to-day whereby man can be produced or created from the earth a full-grown man from one hundred to a hundred and fifty pounds, or in the form of a helpless infant with no possible means of sustaining life for years after its birth. As to the "first man," its parent must have been the highest order of animal life then existing; not necessarily an ape or a monkey, but possibly and very probably a higher developed species, now extinct, exterminated by the prehistoric man, the latter far below the most inferior savage now in existence; hence the parent of the "first man" was but a step below, the development being hardly perceptible; like the child of to-day, through the combined organism of its father and mother it inherits at times superior qualities, which places

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it ahead of the parent stock, and transmitting them to its progeny, its descendants obtain the start in the race of intellectual or superior life.

The gap between man and the next order of animal life at present—say the ape—is very wide; but the gap will continue to widen, so that ages in the future, the gap in the present era, if the facts could then be known, will seem very narrow compared to the very wide gap which must necessarily exist in that distant epoch; and why? Glance at the animal life of America. Not many years since (but a few hundred) the wild beasts roamed from the cold regions to the equator; America teemed with them; where are they to-day? The march of civilization has driven them back; one species after another of the highest order of beasts have been exterminated, so that to-day, where man or civilization extends, nothing remains of the wild beasts, (except a few rare specimens of various species, roaming in the jungle or uninhabited forests of the country), to indicate the homes they once enjoyed, but their bones, and these

through the aptness of the Yankee, are rapidly gathered and converted into manufacturing and agricultural purposes—as, for instance, in the northern portion of America, where immense quantities of bones of the elephant are dug up, also remains of other animals in the bone-beds of Carolina, all being utilized, and their original form destroyed, so that in the future not even the bones of beasts will remain to mark the pre-existence of the higher orders of animal life, except here and there a relic stored away in a museum; hence the gap will continue to widen, and other links will be missing. What is true of the extermination of wild beasts in America, as rapidly as man advances, is becoming true in other parts of the globe. What of the lower races of men? Is not the gap widening constantly here? The living link between civilization and the pre-historic man is fast becoming the “missing link” by the extermination of the aborigines. Take North America, the native home of the poor Indian; from the lakes to the gulf, from the Atlantic to the Pacific, the European ad-

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vances ; he plants himself in their homes ; the Indian is doomed ; the work of extermination begins ; a few only remain to remind us of the original extensive tribes ; back, back they have been driven to the farthest extent of our realm, and the only home that now awaits this small remnant of the aborigines of America is absorption by marriage in American families or the watery deep of the Pacific. The Australian savage is being also rapidly exterminated ; but few remain to indicate the existence of this very low race of men. They are the lowest living on the face of the earth. They can scarcely count four, and after their extermination, future ages will scarce be able to conceive of the existence of these low savages, and unless their bones are carefully preserved, and a record of their race kept, this link will be missing ; the gap between the lowest man and the next highest order of animals will continue to widen. The natives of New Zealand and Feejee Islands, the cannibals, are also being rapidly exterminated. A few years more and nothing but their bones or records, if preserved, will indicate the former exist-

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ence of these wild savages or barbarians upon our planet. If all is lost, another link is missing; and in early prehistoric times there were no printed records or bones preserved, for petrified or fossilized human bones, as before mentioned, are very rarely if ever found. Hence the highest orders of beasts being rapidly exterminated in all countries by the advancing tide of civilization, and the equally rapid extermination of the lowest races of men on the globe, will, in the course of 100,000 years distant, vastly widen the gap, and the "missing link" in that age will prove a far greater puzzle. We have found that the link connecting the lowest man and the next order of animals does not exist, for the gap, we learned, has widened, and is continuing to widen, so that in the distant future the hour must come when every wild beast upon the face of the globe will be exterminated, and with equal certainty every savage barbarian and all the lower orders or races of men must pass away and become extinct. The gap will then become so wide between the bimana and quadrupeds that unless their re-

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mains and records are preserved it will be impossible to form a conception of the pre-existence of these extinct forms. Hence it is fair to presume that further advanced types of quadruped, that were nearer allied to man than now exists, became extinct and buried in the vast accumulation of ages. Paleontology is in its infancy; for the times are comparatively recent since the discovery and classification of fossil remains. Is it not equally probable that types or races of men much lower than any of which we have record, and more closely allied to the quadruped and quadrupeds may have existed in the Miocene, and possibly in the Eocene Age? No rational thinker believes that all forms of animal life were created at the same time; for every geologist is aware that many forms became extinct ages before the appearance of mammals upon the earth; as for instance nine species of trilobites became extinct at the close of the primordial, or one of the early geological ages; eight species at the close of the upper silurian; and all became extinct before the close of the carboniferous, which was

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many millions of years prior to the age of mammals, which includes all animals that suckle their young. What is true of the trilobites is true of many genera, and thousands of species appearing in one age became extinct before the close of the following age.

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CHAPTER III.

*Electricity versus Gravitation.**

The fact, of course, is borne in mind in considering gravitation that the latter is not a property especially inherent in a body itself, say the sun, attracting to itself another body, but exists in the relation between two bodies, requiring two bodies at least to create the relation whereby gravitation is made possible. The earth in December is at its perihelion, or nearest to the sun; it then passes in June to its aphelion, or some three million of miles farther from the sun; the eccentricity of the earth's orbit or the difference between its nearest and greatest distance from the sun, is considerable, yet exceedingly small compared to the eccentricity of the paths or orbits of some comets, a few of which having the aph-

* About 30 years ago, 1874, in the "Bos. Commonwealth," I was first to advance the hypothesis of repulsion, an electrical force, having something to do with the movements of bodies in the starry heavens.]

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elion of their orbits beyond the farthest planet in the solar system, while their perihelion passes within the orbit of Mercury, the planet nearest to the sun, a difference between the nearest and greatest distance from the sun of nearly three thousand millions of miles.

If gravitation is the only force at work among the bodies in space, why does not the sun's immense mass attract the comet into itself, if as claimed, it has power sufficient to attract said comet into his realm from a distance beyond even the farthest planet? Precipitate from a tower, or other high eminence, a huge block of stone; it falls to the earth, but the latter meets it just in proportion to the size and weight of the earth to that of the stone; and the only reason that the earth does not fall upon the stone is because the former is so much larger than the latter. If however, the stone were equal in size to the earth, they would meet just half way—both falling equal distances toward each other; if, further, the stone were proportionally larger than the earth, the latter would fall upon the stone, the power of attraction being greater in the

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latter than in the former; and thus the laws of gravitation are obeyed. The moon, although an attendant to the earth, and revolving regularly around it, attracts the earth to itself, however near its proximity to our globe; the sun although ninety-two millions of miles distant from it, while the earth is only 239,000 miles therefrom, the solar mass being of such immense size, some 355,000 times larger than the earth, its attraction, although at such vast greater distance, governs and controls the moon in its movements as much, and some astronomers think more, than does the earth, even in its comparative near proximity to it. It is also well-known among astronomers that the planet Jupiter, which is some eleven hundred times larger in volume than the earth, exercises greater control over its moons than the earth possesses over its attendant, and why? Simply that Jupiter is farther removed from the sun's attraction, being nearly five hundred millions miles therefrom, while the earth is but ninety-two and one-half millions; and furthermore Jupiter is so immensely large, the giant planet of the

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solar system, he holds absolute sway over matter in his realm, embracing millions and millions of miles in space about him; but owing to the comparatively small dimensions of the earth and its nearness to the sun, our planet is obliged to succumb to the attraction or control of the mammoth solar mass, and be satisfied with the very small and narrow realm around it, over which it exercises but a partial control. Saturn, still farther removed from the sun than Jupiter, and nearly as large as the latter, is less subject to the control or attraction of the sun, and of course is absolute ruler over a wider extent of space than Jupiter, although both are more or less tributary to the immensely greater body, the sun, around which they revolve. The attraction of the sun over matter in its realm, or solar system is very well manifested in the velocity of the planets around his mass. Mercury, the nearest planet to the sun, moves around him with the astounding rapidity of 109,757 miles per hour, and Neptune, the farthest planet from the sun, only 6,000 or 8,000 miles per hour. The influence of the sun over the

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most distant planet, it must be perceived, is very slight in comparison to the amount exerted over the nearer planets, as seen in the rapidity of their motion in their several orbits.

The first law discovered by Kepler, "the radius vector of a planet describes equal areas in equal times," claims that a planet in passing from its aphelion to its perihelion, or nearest distance to the sun, the centrifugal assists the centripetal force and its velocity is quickened, while in its return passage from its perihelion to its aphelion, the farthest from the sun, the centripetal opposes the centrifugal force and consequently causes the planet to move slower. Let us examine this law and ascertain whether both of these phenomena are due to gravitation, and whether, after all, gravitation explains all the motion of bodies in the Solar system.

The centrifugal and centripetal forces we will illustrate by the movements of a horse trained by his master in the circus ring; he is inclined to run in a tangent direction, or in a straight line, away from his master, but the

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long and tight rein checks his tangential or straight course and he is obliged to obey partially the centripetal force which is pulling him towards the master; or in other words, the master pulling one way and the horse the opposite, while in motion a mean between the two forces or directions is the result, and the horse is obliged to travel in a circular path or orbit around the master, who holds him in check. But suppose the centrifugal force, or the horse gets advantage of the centripetal, or the master holding him in check; the result is obvious that the horse would travel more in a tangent direction. Instead of his path continuing in a circle, it would be parabolic or hyperbolic, and the farther the horse is removed from his master, though held in some check by the long rein, the less control or attraction (through the rein) will the master exercise over him, and ultimately it will be impossible to pull him back again, while the force of attraction at the center remains the same, or is not increased. Apply this illustration to a comet travelling from the sun, whose centrifugal force has gained advantage

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over the centripetal and is travelling in a tangent direction from the center of attraction, as in the case of the reined horse from his master, if gravitation is the sole law that explains its movements, how is it possible for the comet when passing so far away from the center of attraction with gravitation lessening in force in inverse ratio to the square of the distance to return towards the sun?

Again, if the master, or the centripetal force, proved to be the stronger, the horse, when travelling in a circle as first described, would be drawn towards the master, and the nearer the horse is drawn to the center of attraction (the master) the less will be the resisting force of the former, and the greater the control of the latter over him, until at last the horse is narrowed into direct contact with him; and if the source of attraction or force instead of being a man, was the ocean, the horse would fall in and be absorbed by the ocean mass. Now apply this illustration to a comet whose centripetal force has gained the advantage over the centrifugal, and is being drawn towards the center of attraction, the

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sun, as in the case of the reined horse to his master or the ocean, and drawn so near by the power of the sun's attraction, as has been observed by some astronomers, that it has just barely escaped touching the sun's mass in passing around it; if gravitation in this instance is the only law that governs its movements, how is it possible for the comet when drawn by the sun's immense attraction almost into its enormous mass to entirely escape being drawn into the sun's mass and absorbed, as in the instance of the horse into the ocean mass just mentioned? We find, however, instead of this result, that the comet at this near proximity is repelled with an immense force away from the sun into space with great velocity, passing in some instances beyond the farthest planet in the solar system. This force is certainly not one of attraction or gravitation, but one diametrically opposite, and what this force is concerns our present inquiry. It has been said and justly, that the cause of every unexplained phenomenon is generally ascribed to electricity, but I do not know as one must

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necessarily be forever debarred from using this immense and thoroughly universal force in the explanation of certain phenomena because some speculative enthusiasts use it in common in the explanation of all their ideal schemes. Sufficient is it to know that certain facts exist; that a comet in approaching and nearing the sun, with its tail following it, the latter ninety millions of miles in length, thinner or less condensed than the head, was immediately repelled by the sun and switched around in the opposite direction, and as the comet rounded it and receded therefrom, the tail, instead of following the comet as when approaching the sun, preceded it. To what is this repulsive action in the sun due? We know very well that it is due to electricity, as no other force in nature possesses this repulsiveness to any noticeable extent. Take for example the great comet of 1843, whose perihelion was so near the sun that it was feared it would fall into it, but it did not and why? because it could not. In its approach to the sun it became so charged with electricity, the sun lost its power of attraction, gravitation

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had no longer any influence upon it, the law of repulsion began to operate, the centrifugal force began to control it, and the centripetal had lost its power, and the comet passed off and away from it in a tangent, as rapidly as during its approach. This is precisely what we should expect it would do, if electricity exercised any control over it. Take Enche's comet, notwithstanding its orbit was approaching nearer the sun at each revolution for several years, it suddenly ceased its nearer approach and why? It became over-charged with electricity, and was accordingly repulsed, and probably never again will it shorten to any great extent its orbit. If it should it will never fall into the sun as it was once feared, for it cannot, as it is undoubtedly charged with sufficient electricity to keep it at a proper distance, and if it should ever revolve too near, it will become so much over-charged with electricity, the repulsive force will become a potent influence, and will send it farther into space than it has ever attained, and with greater rapidity. If this is true of comets and planets, why not true of the stars,

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the sun and all sizeable bodies in space? The recent discoveries of Marconi of the power of electricity, in high altitudes, away from the earth, where an electric current can be more easily controlled and be stronger than upon or near the earth, is a prominent factor in the solution of this problem. He has found that an electric current can be sent from an electrical plate in the rarefied air regions to another plate in the distance without the assistance of any wire to transmit it. If then it is found that electricity has greater power in high altitudes where the air is more rarefied, is it not possible, aye, and I might say probable, that electrical currents continue to exercise the largest control in the interplanetary space, and through all space. Light, heat, and electricity may proceed from the same force, possibly are one and the same force. Electricity travels with nearly the same speed as light, some one hundred eighty thousand miles to two hundred thousand miles a second. Light is transmitted by wave motion from a distant star, or from the tallow candle in the confines of your room, so is elec-

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tricity, and so is heat, as one can easily observe on a hot summer's day as it rises in trembling waves from the heated, sandy plain. Far be it from me to say that gravitation is not a great force in the universe, the greatest, but it exists perhaps in a larger sense under the name of electricity, which not only has the power of attraction, but carries with it repulsion; a positive and negative influence. Present to the prime conductor of an electrical plate machine some pith balls, as I have done in my laboratory, they are at first attracted, and when sufficiently charged with positive electricity they are repelled, the law of electrical force being that a body possessing less than the average amount of electricity, or, properly speaking, is negatively electrified, when it comes in contact, or nearly so, with a body possessing an excess of electricity in the positive passes into the lesser electrified body, the negative, until the latter receives the excess from the positive, or the equilibrium between the two is restored, and both become equally electrified; and when this equality takes place, a repulsion to each occurs,

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as is manifested by the pith balls when coming in contact with the prime conductor, it is soon expelled by becoming positively electrified. The sun contains unquestionably an enormous amount of electricity; the earth it is well known, is largely charged with it, as illustrated by the telegraph. Early in telegraphy a "line" was established consisting of two wires, a thousand miles, more or less, in length; one wire from the battery to its destination, and another what is called a return wire, to make a circuit or connections complete. But it was at length ascertained that the Earth possessed an immense amount of electricity, and by sinking a copper plate at both ends of the line in the Earth it was thought the Earth might answer for the return wire, and thus the expense of one wire for thousands of miles be saved. The experiment proved successful, and but one wire is now used in most telegraph lines in this country, thus demonstrating that the Earth is a great storehouse of electricity. Take for example a "thunder cloud," so-called, or a couple of them, one is more charged with electricity

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than the other; the one positively or overcharged, the other with less electricity, is negative, and as nature always seeks to restore its equilibrium, the positive cloud empties its surplus of electrical force into the negative and the equilibrium is restored. If the Earth is more charged with electricity than the clouds, as is sometimes the case, the electrical current instead of passing from the cloud to the Earth, will pass from the Earth up to the cloud; but I should expect under the same circumstances that if one cloud was very much larger than the other, the small cloud, not being big and dense enough to receive all the surplus energy of the positive cloud, would become overcharged, and the repulsive energy would at once begin to work and move it farther away out of the influence of the mammoth cloud. And the same phenomena I should ascribe to the positive influence of the sun over such light bodies as comets or other light and smaller bodies as the planets, in interplanetary spaces. Now if the Earth, a small speck in comparison to the great sun (some 1,400,000 times in volume, and 355,000

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in mass larger) contains so great a store of electricity, (and through spectrum analysis the sun has been found to contain nearly the same elements as the Earth) what may we expect of this great solar mass, if the quantity increases in proportion to the increase of size? and also bearing in mind that the intensely heated or thermal condition there would render it a greater storehouse of this force, in proportion to its size, than the Earth. Another evidence demonstrates the fact that the Sun is a great storehouse of electricity. Variations of the magnetic needle on the Earth have been recorded. Some years the variations are very great, and some years much smaller; a record also of the occurrence of the spots on the Sun has been kept, and the magnitude of the phenomenon is found to correspond in both instances. Magnetism and electricity in many respects are quite similar. In keeping a record of the appearance of the aurora borealis it was ascertained that the maximum and minimum of intensity for the same number of years corresponded in a remarkable degree to the solar spots and variations of the needle, and the

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cause of the aurora is conceded by most physicists to be due to electricity; hence as the solar spots and the aurora borealis appear about the same time, and with equal intensity, it is fair to presume that the solar spots are largely due to electricity, or electrical action or disturbances in the Sun's own mass. We know that there are tremendous disturbances and explosions in, or on the Sun, that enormous quantities of gaseous matter (which has been ascertained constituted the Sun's mass) are ejected therefrom, and extending from the Sun's limb or edge, hundreds of thousands of miles, and traveling in the shape of clouds around the Sun at the immense velocity of two hundred and seventy miles per second, and if it receives a repulsive impulse or attains a velocity over these figures, which at times is the case, the mass will pass beyond the control of the Sun and never return.

Apply this electrical force to the Comet. It approaches the Sun by force of gravitation, as the Comet nears the solar mass, it being negatively electrified, it receives a portion of the excess of electricity from the Sun, sufficient to

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keep it traveling around, and from falling into the solar mass, and when it becomes thoroughly charged with positive electricity it is expelled with great force into space in a tangential direction, and if the repulsive force given it is excessively great it will describe a parabolic or hyperbolic path, and perhaps not return to the region of the Sun or even the Solar System again, for thousands of years; if the repulsive force given it is not so great it will describe an elliptical path, and as in some instances, not pass beyond the planet of Jupiter, or with others, as Halley's Comet, will pass but little beyond the farthest planet, Neptune, and when the repulsive force received is expended, the Sun's attraction exercises its control over the Comet and draws it again in the direction of the Solar Mass, to be again positively charged with electricity, as it circuits around the Sun, and repelled as before into space, describing regularly an elliptical orbit around his mass. What is true of Comets, must be true of planets, for all of them are attracted more or less towards the Sun in the orbital motions, and also repelled

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with equal force. If very small cosmical bodies are attracted and fall into the Sun's mass, being positively charged, they are immediately expelled, and the process continued.

Sufficient has been observed to substantiate the proposition, that electricity in its positive and negative properties, (attractive and repulsive,) has a greater influence in the movements of bodies in the starry heavens than gravitation, which is solely an attractive force and does not possess the properties of reulsion.

CHAPTER IV.

The Earth's Extension.

Our uninstructed senses fail to perceive many important changes in progress upon the Earth's surface and in space. If a body set in motion meets with resistance, whether in the form of a solid, liquid, or ether, its apparent motion ultimately ceases and a loss in weight results, for when a body meets another, however light or ethereal the latter may be, friction will ensue, and where there is friction there waste commences and the original motion apparently ceases. What is the condition of the interplanetary or stellar space? With the finest instrument yet made, a perfect vacuum has not been produced upon our planet. Space or a portion of space, absolutely empty, is an impossibility, as impossible as the existence of a bounded or limited universe. All space must be filled with something and that something in the interstellar space we call ether, for want of

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a better name. What is this ethereal substance pervading the universe? We claim that it is a part and parcel of all the heavenly bodies in space, the extension of the planets, suns, comets, meteors, nebula, etc., etc. The Earth during its early formation is estimated to have been some 1,900 times larger than at present, this was when in a gaseous condition; its dimensions, now as recorded, is about 25,000 miles in circumference and 8,000 miles in diameter, but this can be but a part of all that constitutes the make-up of our planet. The atmosphere surrounding the solid is none the less part and parcel of our globe, however light its constituents. How long could life be sustained without the air we breathe; it is just as essential as water, which is not a solid, yet covering three-quarters of the solid earth, and the atmosphere is more or less filled with water, in the form of vapor. Forty-five miles are given in text books as the height or limit of this gaseous envelope and by mathematical estimates this at first thought may appear correct, but to make an arbitrary line and within which confine the atmosphere, stating that to

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this point the latter extends and no farther, beyond which is empty space, is an absurdity. Ascend to the summit of Mt. Blanc, and we find the density of the atmosphere at that height lessened considerably as compared to that of the valley below, so rarefied or thin, that it becomes quite a task to live in that region any length of time, but is the atmosphere at this height any less an atmosphere because of its increased thinness or rarity? and when we reach 45 miles in space, or 5,000, is the substance therein contained any less a portion of the globe as its atmosphere, because at that great distance from the solid upon which we move, it becomes so rarefied that our estimates and comprehension fail to recognize the fact? As well might the anatomist centuries ago have doubted the geologist who should dare predict that the time would come when in a single grain of slate 187 million of fossil skeletons would be found complete in all their parts. The Universe is one entire mass of matter, portions are condensing, solidifying and crystallizing into and forming worlds, and in turn are wasting, decomposing, decaying

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and returning to its original nebula or ethereal state.

What is the cause of the decay or decomposition of stars or worlds? In the first place Suns are luminous bodies, constantly giving out heat and light. When a luminous body upon our planet gives off heat and light we know that something is expended and in the course of time that portion giving off said heat and light will be consumed or condensed, solidify and become a solid; can we expect anything less of the suns? To be sure, as J. P. Mayer suggests there may be a remunerative agency to compensate the Sun for the immense expenditure of its mass into space, to produce the amount of heat the Earth alone receives. Be this as it may, we have found that if all parts of the Sun expend an equal amount of heat and light, the time will come when his original mass will be cooled and solidify. The photosphere and chromosphere; a gaseous envelope, which is acknowledged to be a part and parcel of the Sun, extends far beyond his denser nucleus mass, the whole extending hundreds of thousands of miles be-

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yond the Sun's nucleus. The time will come when lenses will be made with sufficient power to trace the atmosphere of the Sun, composed of emanations from his mass, not only hundreds of thousands of miles as at present discovered, but millions of miles. During the progress of the eclipses, an atmosphere or emanations were found to exist beyond the chromosphere. What I have said in relation to our Sun, the Earth, and their atmospheres or extensions into space, applies to all the suns and planets in the Universe. The so-called ether filling the interplanetary and interstellar space throughout the Universe, is undoubtedly fed by the constant expenditure and emanations from the numberless suns, burning and seething as a fiery lake. If it is true as previously stated, that the Earth's atmosphere extends into space thousands of miles, its thinness or rarity exceeding our mathematical estimates and comprehension, it is probable that the same is true of all other planets in space. Nature abhors a vacuum, and that a defined limit to our planet or other planets or suns exists, beyond which is empty space, devoid of any sub-

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stance, ethereal or otherwise, is a theory that cannot be substantiated.

CHAPTER V.

The Philosophy of Immortality.

Is there life beyond the grave, or is there not? That is the question and there's the rub! For thousands of years this question has been asked, and should the world exist five hundred thousand more, it will still continue to be questioned as time or eternity upon the planet will never settle this problem in the minds of all, for while spirit and matter remain two distinct, uncombined elements, with our senses totally incompetent in themselves to analyze and detect spirit which is an untangible an imponderable force; the question will always be an open one as it is only through our material senses that all solid and positive facts are determined and settled. If the thinker, however, outsteps the bounds of material knowledge and experiences, into the realm of thought and reason and views the spirit, the beyond, the ultimate in the light of philosophy

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and common sense, his faith will be founded upon a rock. In my travels nothing surprised me more in conversing with the masses than the incredulity, the increasing unbelief, the general doubt of an existence beyond the grave; and the alarming increase is not confined to a scattered few, but found among all classes, and not detected by the general observer, but discovered in debates and close questionings. It would not surprise me could the people scattered over our continent be carefully questioned as to whether they entertained any doubts concerning a continued individual existence beyond the grave, the honest reply of one half would be in the affirmative. We have relied too much upon authority, and less upon our common sense and reason, and when we have grown large and broad enough to realize the use of the powers God has given us, and through which alone we are placed pre-eminently above the entire animal kingdom, we shall have larger comprehension and look as never before into the great future and life eternal. What is matter? "It is the substance," in the words of Webster, "of which

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all bodies are constituted, or that which is visible or tangible." In illustration take a locomotive on the railroad track attached to passenger cars, instruct it to move, when would you reach New York by the train if the locomotive was left to itself to start? No, you say, there must be force applied to it to propel it. Who is to apply this? You say man. Suppose we take one just asleep in death and place him on the locomotive with full instructions to run the machine. Your request is complied with. A man is placed on the engine, but does it move? Why not? All the conditions dependent upon matter are satisfied. Can you call to mind any form of matter that will in itself meet the case and send the locomotive on its mission to the great metropolis? Is there any one on our planet ingenious enough to so compound or unite matter in any form or shape to meet the desired end? None? But if all there is to man, is the matter of which his body is composed, how do you account for this strange anomaly? It is something outside of matter, is it? What is it? What is this something? Is it force? Steam

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is generated and applied to the engine, and thus through the forces of heat and motion the locomotive moves, but did these forces in themselves, without help or assistance, alone and in their own power move it? Is there not something behind these forces which sets them in operation? Who generated and applied the steam? Man? What the material man? The dead man whose body is all there is of him? We have found then, that there is something behind matter; something behind the force itself that moves it. Man contains it. It is not his body as we have proven. It is no known force as we have demonstrated, but something behind them both; it is life or spirit, both one and the same thing.

Galvani, the discoverer of Galvanic electricity in a work published at Bologne in 1791 for the Institute of Sciences says, he was "dissecting a frog on a table whereon stood an electrical machine, when the limbs suddenly became convulsed by one of his pupils touching the crural nerve with a dissecting knife." "Galvani," says Bakewell, "entertained the opinion that muscular action is attributable to electric-

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ity, and looked on this phenomenon as a confirmation of that opinion, and pursued the enquiry with great zeal. He attached the legs of frogs to a pointed conductor fixed at the top of the house, and found that they are violently convulsed by every flash of lightning. Similar effects, though not so strong, were also brought about by atmospherical electricity, when there was no thunder storm. As this effect was produced without any apparent external excitement of the electric fluid, Galvani inferred in accordance with his preconceived hypothesis, that the muscular contraction was caused by animal electricity. Physiologists eagerly seized hold of this assigned cause of vital energy, and abandoned the agency of the nervous fluid for that of electricity.

Volta, a wiser man and far more eminent in science, the true discoverer of Voltaic electricity now applied throughout the world, annihilated the theory that the exciting cause resided in the animal fibres, and contended that the muscular contractions produced when the muscle and the

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nerve were connected by a metal, arose from the contact of the metal itself, and was entirely independent of animal electricity. In proof of this he instanced the peculiar sensation occasioned by the contact of a piece of silver with a piece of lead or zinc, when both are placed upon the tongue. What a blessing it would have been if Galvani could have succeeded in bringing to life men lying in their graves by the application of electricity to their limbs, but alas it requires something beyond the force of electricity to produce the emotions and movements which man, aye, a live man exhibits. Dr. Carpenter, the distinguished English scientist, advanced the theory that heat is the life, the vital force that animates our being and all matter; but with like consistency he might claim the same pre-eminence for oxygen, for without the presence of the latter, seed could not germinate, nor the egg develop into life. Suppose we search for the most ingenious fellow in the land, and instruct him to make of clay the form of a man, perfect within and without, fill its stomach with food, then the body with electricity or heat, will it walk,

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talk and think? Is there any force under the control of man that can be put into action which will produce the results mentioned? Faber, the ingenious Frenchman, constructed a voice automaton, whereby the instrument could be made to talk, to articulate with as much distinctness as with many men who speak our language. In its rude state the form presented no similarity to man, but when the bust was placed over the instrument, and made to articulate the imitation was complete, and to one who did not see the power behind it, it appeared life-like. The instrument was perfect, the voice produced wonderfully good, but it did not talk of its own volition, there was a power behind it, not the fingers that played upon the keys which caused the varied sounds proceeding from the mouth of the automaton in imitation of the human voice, but something beyond.

It is that which moves your fingers and mine. It is the life, the spirit that prompts the movement.

What is it that talks in you and me and gives expression to our countenances? will

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electricity do it? will heat, motion, light, chemical affinity, magnetism or any other force known to man produce it? What is it that sparkles the eye and gives emotion to our whole being? Something independent of the forces, independent of matter, and being independent it cannot be deposited with my body in the grave; it is life, spirit, not tangible or ponderable, but too ethereal to be entombed. Denton cites some illustrative facts, which are to the point. "Dr. Atkinson says, 'I had once a very remarkable patient, who, with eyes closed, could easily read any writing I gave her. She read it from the top of her head, or when placed in her hand, or from any part of her body; and it was to be noticed in this case, that the more tightly you pressed upon her eyes the more clearly she could see.' "

Here is an instance where a person was not obliged to use the material eye to read; how soon the eye loses its transparency, its brilliancy after life, the spirit has left it, but behind the material eye, or within it, is the spiritual, and in the lady mentioned, the spiritual was very largely developed, so large that it enabled

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her to see and read without the use of the lens of the material eye.

The crystalline lens of the eye is simply an instrument for the spiritual eye to look through. These lens to the aged are nearly useless and they are compelled to go to the opticians and purchase other eyes or lens for the spiritual eye to see. To prove that the matter read by the lady with her eyes closed was not due to any familiarity with the writing I will cite another instance which he gives: "Dr. Colby, of Stanstead, Canada, informed him that he had a patient who read for him a paper, just taken from the press, with her eyes bandaged, and a tea tray between her eyes and the paper." Here was reading matter entirely new to her, just received from the printing press and was new to everybody. What is it that enabled her to see, or read without the use of even her material eyes? Matter? Force? Is it that power, that something which you and I and all possess; life, spirit, but more developed in her in this direction, the eye, the spiritual eye, than in most of us. Again, during sleep our bodies

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are apparently in perfect rest, but in our dreams, the mind, the thought, the spirit is active. Says Dr. Hammond: "During sleep, the brain is in a comparatively bloodless condition, and the blood in the encephalic vessels is not only diminished in quantity, but moves with diminished force." Denton says, "If the brain is the agent concerned in clairvoyant and clairandient phenomena (its power being very much reduced by sleep) we should naturally expect it would decrease or destroy its ability in this direction; but the very opposite seems to be the case, for many who possess no clairvoyant power in the waking condition have in their sleep, a remarkable development of it." Dr. Carpenter relates, that "Condorceet saw in his dreams the final steps of a difficult calculation which had puzzled him during the day," and Candillac states that when engaged with his course of study he frequently developed and finished a subject in his dreams which he had broken off before retiring to rest. "Can it be," he says, "the brain, the material brain that does this in sleep, when it has been unable to accomplish it in the waking state? We might as

well suppose a man could run eight miles an hour with his feet shackled, while he could only run four when they were free." Denton again cites Lydia Marcia Child, the distinguished author and reformer, who published the following statement regarding her deceased friend, Henrietta Sargent. "One morning, she spoke of not feeling as well as usual but it was regarded by herself and others as merely a slight deviation from her customary good health. But in the course of the day she suddenly fainted away. As the usual restoratives produced no effect, the family physician was summoned. No better success attended his efforts. The breath appeared to be entirely suspended, and the limbs remained rigid and cold. Her daughters feared she must be dead; and the doctor began to be doubtful whether animation would ever be restored. How long she continued in this state I do not remember. But while they were watching her with ever-deepening anxiety she gasped feebly and after a while opened her eyes. When she had completely recovered, she told her daughters she had been standing by them all the time, looking

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upon her lifeless body, and seeing all they did to resuscitate it, and she astonished them by repeating the minutest details of all that had been said or done by them and the doctor during her prolonged state of utter insensibility." It is then evident that the spirit acts independantly of the living body at times, what then prevents its living after the final separation for all time? If it is so active when the body at night is asleep, and dead as it were to all the world about it, what is there to prevent the spirit being active when the body is completely dead and laid separately aside?

What is it in the mesmeric operator that compels another to do his bidding? Take the life principle or spirit away from the man; the body would exhibit poor results in this direction.

It is the will, the spirit in the body of the mesmerizer that is "en rapport" with the spirit in the body of his subject that wills him to do as he pleases, the one is positively charged with a strong spirit, the other negatively with a weaker spirit. Dr. Foissac magnetized Paul Villagrand at a distance of three hundred

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miles. It is said of him, the doctor gave a note to his father which he desired him to hand to Paul at half past 5 P. M. It read thus: "I am magnetizing you at this moment; I will awake you when you have had a quarter of an hour's sleep." But the father to make the experiment decisive, never gave the letter to his son. Nevertheless at ten minutes before six, Paul being in the midst of his family, experienced a sensation of heat, and considerable uneasiness. His clothing was wet through with perspiration; he wished to retire to his room; but they detained him. In a few minutes he was entranced. In this state, he astonished the persons present by reading with his eyes shut several lines of a book taken at hazard from the library, and by telling the hour upon a watch they held to him. He awoke in a quarter of an hour. Here was a clear case of a spirit acting upon spirit in the body, (not matter upon matter) at the great distance of 300 miles from each other. The question now arises whether this life, force or spirit manifested in different bodies is sufficiently individualized to enable it to preserve

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its identity throughout eternity; or in other words will each of us live and continue our personality through eternity individualized in one person as upon the Earth, an individual entity, a spiritual body dispossessed of matter, or is it swallowed up in a Universal life or spirit mass pervading the Universe? Advocates of the latter notion tell us that as a drop of water falls into the ocean, mingles and is lost in the great liquid mass, its individuality and identity ceases, as does the life or spirit departing from the body pass into the great universal life or spirit mass, and its individuality is forever lost. Let us see if this illustration holds good. Water is made up of two elements, oxygen and hydrogen, and the smallest particle into which a drop can be divided is a molecule. Picture in the mind the smallest particle of water imaginable and divide it into a million times, and it is not yet reduced to the size of a molecule. Each molecule, the base of all matter wherever found, and in whatever shape or form, is always unalterable, and ever retains its individuality.

Oxygen, we obtain from water, air and

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very many different compounds, also from rocks through the geological ages, from the Tertiary to the Silurian or the Azoic; and if through this vast extent of time, millions and millions of years, any change was effected in its properties the specimens would manifest it, but no change is manifested. Hydrogen, the other component part in a drop of water is also procured from coal, water, etc. Two litres of any specimen of hydrogen will combine with one litre precisely of any specimen of oxygen, and will form two litres of the vapor of water. If by lying in rocks through all the geological epochs of the past, passing through the volcanic and heat changes to which the rock is subject; or in space dashing along as comets, and meteors of which it is part and parcel, if any change or modification in the molecules had occurred, these relations of oxygen and hydrogen above mentioned would no longer exist, but the same proportion of combination between these two elements exists to-day as millions of years ago, showing that the individuality or identity of the molecule of oxygen or hydrogen, composing the drop of

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water is preserved through all time. Now if the lowest condition to which matter can be reduced, the atom or molecule (the former being the smallest division of a single element, and the latter the minutest division of a compound) preserves its individuality under all conditions and through all time, pervading all space upon the Earth, whether in the solid, liquid or gaseous form, is it any less probable that the universal life or spirit force pervading the universe, divided and dwelling in innumerable, individual forms, will preserve its identity through whatever changes the mass of matter with which it is connected may pass through? To be sure the material body of a man dies, the form is not preserved or individualized, but the atoms or molecules of which it is made up remain the same, retaining their constant individual form and shape; and the life or spirit which builds them up and holds them together in the form of man, when it loosens its hold and escapes, can it be any less individualized than the atoms or molecules which it partially controls? An army, for example, is made up of individuals,

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they move collectively as one body. Take the “Army of the Potomac” in the Cival war of 1861-'65, they moved in one solid phalanx, united in one single purpose and imbued with one and the same spirit of love and defence of their country. At the close of the war this body or army decomposes, so to speak, falls to pieces, or scatters into its original individual elements of men. As they return to their respective homes the Army as a body is no more, but the spirit that moved them through the fields of blood in the defence of their native land still lives, and will continue to live, as an individual part of the nation’s struggle for existence.

The material body of man changes or wastes away, the physiologist tells, once in seven years; not one particle of his body in any form remains at the end of that time. The change is very gradual, the waste of the entire body is constant; and it is to supply this great waste that we are obliged to eat, thus furnishing a new body constantly and gradually as the latter is wasting; and sleep is a brake put upon the body at night, to stop the waste going on in

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our waking hours. Eating supplies the waste like the petrifying process of wood, a strip of it lies in a limestone region, the wood slowly wastes away, and as rapidly as a particle, an infinitesimal particle drops, lime works in, hardens and fills the place, and thus as particle after particle of the wood is wasting, new matter as gradually fills in, and so slow is the process, the form of the fibres and tissues of the wood is preserved through the same gradual process; not a particle of the strip of wood remains; it is petrified, the entire waste of wood is substituted by limestone. Now the fact is significant that as every molecule or particle of the body wastes or returns to the Earth in seven or more years, why, if the mind or spirit is not entirely independent of the body, and does not preserve its individuality or identity apart from matter, does not consciousness or memory which is part and parcel of the mind, waste away with the body in seven or more years? But on the contrary, the octogenarian is more conscious of events that occurred seventy years ago, or in the days of his childhood, and can remember them with

greater ease than events occurring within the space of seven years of his advanced age. Is the soul, the spirit immortal? Why do you, why do I ask the question? In the asking alone lies the proof. Do you desire to live beyond? Is there a man living in whom this desire is not planted, be he Indian or European, Chinese or the wild African? The desire to live beyond is inherent in every being on the face of the Earth. Is this a faculty made in vain? It is well known in science that the disuse of any organ weakens it, and that the disuse of it for many generations renders it worthless, the part becoming comparatively lost, for nature throughout her realm, as any studious observer can testify, destroys very gradually, any faculty or aught else that is not in use. Take an instrument unused, how soon it goes to ruin. The piano, the clock, the violin, a machine, an engine, a boiler, a stove, pots and kettles, a horse even, if he stands idle in the stable becomes worthless. Nature abhors anything that is useless, for nothing is made in vain, and we may rest assured that the desire to live beyond the grave

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was not made in vain, for this is a natural desire, and a faculty that has not weakened or become lost, for it is *used*, not disused. The oldest history extant, the first written record we have of man, thousands of years in the past furnishes us with the desire and belief of man in that remote period in a life beyond the grave, and this desire is not only as strong, but stronger in the 20th century than in the past. What would be the happiness of today if we gloried not in the anticipated joys of to-morrow? We live in the future both here and in the hereafter.

The entire universe is like a clock, every part and parcel of it plays in its own orbit, and it matters not how inferior the part, for its place is just as important in the completion of the great whole. If a ball is tossed into the air, it must obey the law of gravitation and return, the earth will not part with any of its constituents. Nothing exists or moves by accident, or chance. An accident is an impossibility! It appears as an accident only through our ignorance of the law, and that which we call an accident is really the faithful operation

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of the law, for if our carriage breaks down, it is in obedience to the law of gravity which is constantly pulling it and its contents to the ground; if a ship sinks it is in obedience to the law of gravity which is constantly operating to bring it to the Earth at the bottom of the sea; if a house is consumed by fire, it is in obedience to the law of combustion, the accident was due to carelessness and disobedience of nature's law. The Earth moves in its orbit around the sun with unerring exactness. Since the dawn of civilization, thousands of years ago, its movements have been studied. It completes its circuit around the sun year after year and has never failed to reach the place from which it started, a year before in 365 days, six hours, nine minutes, ten seconds and 75-100ths of a second, not a fraction of a second has it ever varied, either slower or faster in the thousands of times it has traveled around the course, a course extending 550 million of miles and traveling 1,133 miles a minute or 60 times faster than a ball fired from a cannon's mouth. So is it with all the planets in the solar system. Saturn, the ringed planet

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is so far from the Sun, its path or course around him is very long, but with unerring certainty it makes the revolution in 29 of our years and 167 days, no more or less in the countless times it completes the circuit. So sure and exact are the laws that control all bodies in space, astronomers with the utmost precision can determine the year, the day and the hour, though 50 or a hundred years distant, that any celestial phenomena may appear in the heavens. Why then tangle our brains with doubts of the hereafter? My trust is unbounded in the powers that be, for the same care and exactness displayed in the movements of all bodies in the Universe is meted to us, and whether we will it or no, "Thy will must be done on Earth as it is done in the heavens," and life, spirit, the very essence of our being is by no means the least. It is the kernel of everything and will roll on in its own orbit through the dim vista of eternity.

CHAPTER VI.

Some Criticisms on Ancient and Modern Philosophers' Theories.

The ancient and modern philosophers rarely agreed in their line of thought. "Their philosophy" as Lewes, the English savant says, was "a play upon words" and was utterly lacking any solid foundation upon which the past, present or future ages could build any framework of rational principles that would give a complete, reliable, and indisputable conception of the inner or outward life of man. Let us review, very briefly the theories of these Ancient and Modern Philosophers which have held the speculative mind of thinkers for many centuries. *Beginning with Thales, one of the earliest philosophers on record, who flourished about 636 years B. C. He advocated

*In my makeup of the synopsis of the varied schools of philosophy, I have used more or less as my authority, Lewis's History of Philosophy.

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that moisture was the fountain from which everything sprang, the beginning, and by which everything was controlled. It was the basis of all things in existence about us. Water was only one of the four elements, but it was the basic element. Anaximenes followed Thales. Water in his opinion was not the most prominent element. He believed there was something within him, and without, that was more prominent, and that was air. It was the basic element of his life and other lives. The air was universal. Everything was dependent upon it. When we breathed in the air, and when we breathed it out, it was but a stream of life passing in and passing out. Later came Diogenes of Apollonia. He went a little farther and believed that air was the basis of the soul, the living, intelligent force. The Universe was a living being, spontaneously evolving itself. He attributed to the world a set of respiratory organs which he fancied he discovered in the stars. Man is superior to brutes in intelligence because he inhales a purer air than brutes who bow their heads to the ground. He believed not only

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that air was life, but it was the fountain of intelligence, and that intelligence must have been the First of Things. Pythagoras was born B. C., 610 or thereabouts. He introduced the term "Philosophy." His school was called the mathematical. "Numbers" he says "are the cause of the material existence of things." "Every individual thing is always *One* thing, nothing can destroy that numerical existence. Combine the Thing in every possible variety of ways, and it still remains *One*. It cannot be less than *One*, and no more than *One*. The Infinite must therefore be *One*. Two is but the relation of *One* to *One*. All modes of existence are but finite aspects of the Infinite. So all numbers are but numerical relations of the *One*. . . . *One* is necessarily the beginning of things so eagerly sought for by philosophers, since wherever you begin, you must begin with *One*. Suppose the number be three, and you strike off the initial number to make two, the second then will be *One*. In a word, *One* is the beginning of all things.

He also taught the transmigration of souls

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. . . The soul in man is in a state of comparative imperfection. It has three elements, reason, intelligence and passion, the two last, man has in common with brutes, the first is his distinguishing characteristic. Each of these aspects may predominate, and the man will then become eminently rational, able, or sensual. He will be a philosopher, a man of the world or a beast."

Xenophanes B. C. 616, belonged to a school of Philosophers called "The Eleatics." He believed that God must be self existent, for to conceive Being as incipient was impossible. Nothing can be produced from nothing. Whence therefore was Being produced from itself? No; for then it must have been already in existence to produce itself, otherwise it would have been produced from nothing. Hence the primary law. Being is self-existent. If self-existent, consequently eternal. All must be unmoved; there is nothing to move it. It cannot move itself, for to do so it must be external to itself. He believed that sense (the senses) was the only criterion of things; the only source of knowledge.

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Anaxagoras denied certainty to senses. The senses did not see the essence of things, but only the phenomena, the appearance of things—not the noumena, the essence. The senses are accurate in their reports, but their reports are not accurate copies of things. They reflect objects, but they reflect them as these objects appear to sense. Reason has to control these impressions to verify these reports. For instance, the senses may subjectively inform us of its impressions but they may be false, as a stick appears broken, half of which strikes the water, but it is objectively false, unbroken. So far from the all being the *One*, he proclaimed the *All* to be the many, the mass of elements, and the power to arrange them in one harmonious system he declared to be intelligence, the moving force of the Universe. Having disclaimed Fate and Chance he proclaimed intelligence the arranging power, but it exists alone, in and for itself.

The Sophists preceded Socrates and were a set of Philosophers who tried to overthrow all the doctrines of previous philosophers. They did not believe in Philosophy as a study, they

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thought life consisted in enjoying yourself innocently. They did not care to go to the basis of things, but argued upon the surface. Their arguments were shallow and lacked depth and solidity. They presented *no* permanent system.

Socrates first made use of definitions, and proceeded by induction. His philosophy was promulgated largely by questions. He professed to know nothing of philosophical propositions, and had no patience with those who professed to know. He confounded these philosophers by his searching, philosophical mode of questioning; hence before he got through with them they were wound up into a snarl and found that Socrates knew more than they, though unprofessionally. He believed in method in philosophy. He was the founder of a new epoch, and some regard him as the founder of Greek philosophy. It may be doubted whether any one before Socrates ever used the words germs and species in the philosophical sense now appropriated to them. Truth was to be sought by looking inwards, not by looking outwards. Definition is the

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one grand characteristic of the method Socrates originated. Aristotle says, "The speculations of Socrates were only concerning ethics, and not at all concerning nature in general." He believed no science could be taught, only drawn out. Each man must conquer truth for himself, by rigid struggle with himself, he must work it out and not copy or borrow it from others. Socrates had no school, he taught no system. He exhibited a method. He had no especial building or grove, as did Plato to talk and question with his followers. He went into the market place or other places in business marts and streets, and there his admirers assembled about him.

The Cynics was a school represented largely by Antisthenes and Diogenes. It was a school that did not believe in any ostentation, no show of dress or in any fashions of society. Their aim was to differ from other men. Antisthenes appeared in a threadbare cloak, with ostentatious poverty. Socrates saw through it all and exclaimed, "I see your vanity, Antisthenes, peering through the holes of your cloak." Diogenes of Synope's aim in

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life was to live a life of virtue. That virtue was cynicism. It consisted in the complete renunciation of all luxury, the subjugation of all sensual desires. It was a war carried on by the mind against the body. The body was vile, filthy, and degrading, it was the curse of man; it was the clog upon the free development of the mind; it was wrestled with, hated and despised. He slept under marble porticos of buildings or in his celebrated tub. Decency of every kind he studiously outraged. It was a part of his system to do so. It was an outrageous system, but nevertheless it required considerable moral courage to preach and practice it.

Plato taught his philosophy in the form of dialogues. He affirms nothing, but after producing many arguments and examining a question on every side leaves it undetermined. Some regard Plato as the expounder of the doctrine of Socrates, and others regard him as the originator of a new philosophy. He was undoubtedly a follower and to a large extent an exponent of Socratic philosophy. He had the remarkable faculty of understanding and

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absorbing all the prominent points of the philosophy of his predecessors, he was an encyclopedia of the learning of all before him; the treasury of the intelligence of the age. His method was thus: If the subject be virtue, the general term must first be decomposed into all its parts, i. e., into all its virtues and from a thorough examination of the virtues a clear idea of virtue may be attained. Plato was a realist, a communist. Children belong to the state; property belonging to individuals must be abolished. The state alone has riches.

Aristotle (B. C. 384) was at the summit of ancient philosophers. Before laying down his own views he always examines the views of his predecessors with tedious minuteness and his own opinions often seem brought out in his criticism rather than dogmatically affirmed. Hence some have declared his method to be the historical method. Plato stands philosophically between Socrates and Aristotle. The distinction between brutes and men in the mind of Aristotle is that the former, although they have memory have no

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experience, that is to say have not the art which converts memory into experience. The method of Aristotle seems to be the method of positive science, he maintained that the completeness of knowledge is obtainable through completeness of experience. He made experience the basis of all science, and reason the architect. Aristotle was a prominent writer on Natural History. A vast amount of money was spent for him in obtaining animals by Alexander that he could study their habits, etc. Aristotle created moral philosophy.

Sceptics, of which Pyrrho was the founder, claim there is no criterion of truth. Our senses or sensations do not give us the true image of things. An apple to some is brilliant, odorous and sweet, while to others of poorer sight, scent and taste, it may be dull, rugged and insipid. Our knowledge is the knowledge of phenomena, the appearance of things and not the real thing or the criterion of things for others to follow. Reason it is said by other philosophers is the criterion of truth, but what proof, the Sceptics say, have you that reason never errs, and is ever correct?

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Because we only know things as they appear to us, not as they really are, all attempts to penetrate the mystery of existence must be vain, for the attempts can only be made on appearances.

The Stoics were represented by Zeno the founder. Zeno's thoughts were centered mostly on morals. He was practical, and believed in a practical life. Virtue was above pleasure. Their philosophy was something like the Cynics, but unlike them in so far they did not preach or practice their grossness and indecent habits. The Stoics of Rome were soldiers and had a contempt of death. Their combats in the gladiatorial arena hardened the feelings, both of the performers and the observers or auditors. The Greek Stoics were different from the Roman, they did not fear death nor did they despise it. They loved life, but when the time came to fight for their country, they gave their lives without a murmur. The Stoics in their dread of becoming effeminate, became hardened as marble. They despised pain. To be above pain was thought manly. This however must be affectation, for

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the pain is there, and the visible suppression of it is only a matter of nerve and habit.

Greece no longer produced philosophers. They had exhausted all the theories in the past that could be invented. From Thales to the Stoics every manner of speculative and practical hypothesis in the realms of philosophy was brought out. In Alexandria, Egypt, the next attempt to bring out philosophical propositions was inaugurated by Philo and Proclus a few years before Christ, but it was of comparative short duration. Nothing of any great importance was added to philosophy for nearly two thousand years after Aristotle, a period from 384 years before Christ to about 1,561 years after. Then Bacon came upon the scene, and gave philosophy a new start after a rest of so many centuries. Bacon is generally called the father of experimental philosophy, although it was taught to some extent by some of the ancient philosophers. His prominence is due to his system of presentation. He believed in a gradual verification of all statements made through research. He was not satisfied in advising enquirers to

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make experiments and observations, he told them how observations and experiments ought to be made. He separated science from the church.

He was very much opposed to the doctrines of Ancient Philosophers. He did not believe their genius availed them anything, and the same is said of Bacon by the writers of to-day.

Bacon's method was the inductive method, and so was that of Socrates, but the latter was concerning the life within, while Bacon's was upon life without, as seen in nature in all its variety. But Macauley says, "The Inductive method has been practised ever since the beginning of the world by every human being Induction being the process of all reasoning, of course so long as men have reasoned, they have reasoned Inductively."

Descartes is considered the father of Modern Philosophy. He thought that the existence of God and the nature of the soul were chiefly propositions which ought to be demonstrated rather by philosophy than by theology. He advocated that the consciousness of his existence was to him the assurance of his

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existence. He makes consciousness the main thing in his philosophy. Consciousness is the basis of all truth, there is none other possible. Here we have a new basis, and a new philosophy introduced. Consciousness was the basis of all knowledge, it is the only ground of certainty. His axiom is, "All clear ideas are true, whatever is clearly and distinctly conceived is true. This he considers is the foundation of science, the rule and measure of truth.

Spinoza who followed in the 17th century, asks, "What is the Noumena, the foundation, the thing itself, which lies beneath all phenomena? We see everywhere transformations perishable and perishing, yet there must be something beneath which is imperishable, immutable, what is it? We see a wondrous Universe peopled with wondrous beings. Yet none of these beings exist *per se*, they are not the authors of their own existence. The great reality of all existence is substance, that which underlies phenomena. The principle doctrine of his school is, "there is but one infinite substance and that is God. Whatever

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is, is in God, and without Him, nothing can be conceived. He is the Universal Being of which all things are the manifestations. He is the sole substance, everything else is a Mode.

Locke, who was born in 1632, was the founder of Modern Psychology. The leading questions of philosophy he scientifically reduced to the primary question of the limits of human understanding. He studied the origin of our thoughts. He did not study books, he believed in self education. He studied savages and children to collect facts concerning the origin of ideas. It is because men, he thinks, have analyzed the mind in its cultivated condition, that they have been led to false results. Had they compared their analysis with that of an uncultivated mind, they might have gained some insight. He advances the thought that men extending their enquiries beyond their capacities and letting their thoughts wander into those depths where they can find no sure footing, it is no wonder that they raise questions and multiply disputes, which never coming to any clear resolution, tend only to confirm them at last in perfect

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Scepticism. He believed that our ideas are derived from two sources, sensation and reflection, and our knowledge is founded on experience. "If it is demanded," he says, "when a man begins to have any ideas, I think the true answer is, when he first has any sensation. For since there appear not to be any ideas in the mind before the senses have conveyed any in, I conceive that ideas in the understanding are coeval with sensation," hence the conclusion is easily arrived at, that there is no such thing as innate ideas as some advocate.

Berkley would accept nothing only what his senses informed him. He says that "since those immediate objects of perception, which according to you are only appearances of things, I take to be real things themselves. The table he saw before him certainly existed, and not simply the appearance, there was no invisible substance supporting that table. . . . All our knowledge of objects is a knowledge of ideas; objects and ideas are the same. Our knowledge is subjective. Idealism agrees with realism, in placing reliance on the evidence of sense."

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Kant, born in 1724, called his system the Critical Philosophy. He believed in the reliability of consciousness, and a system of morals, a belief in a future state and in the existence of a God.

Fitche, who was born in 1762, believed that the ultimatum of man was not thought, but action, which is thought realized. The will he considered was the cause, the living force or spirit in man, as motion was the moving power of the world, and realized in contact with our senses. He was an Idealist, and idealism is the system or theory that denies the existence of material bodies and teaches that we have no rational grounds to believe in the reality of anything but ideas and their relations.

Shelling, born in 1775, says philosophy begins where ordinary knowledge terminates. He believed the Ego and the Non Ego were equally real. It is as impossible to conceive an object known without a subject knowing as it is to conceive a subject knowing without an object known. Nature is spirit visible. Spirit is invisible nature. Shelling

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had three divisions in his system. The philosophy of nature, the transcendental philosophy, (which he claims is to have a true knowledge of all things, material and immaterial, human and divine, so far as the mind is capable of knowing them. This definition is now generally accepted.) and third, the philosophy of the Absolute or Infinite. Consciousness so long accepted as the foundation of philosophy, he discarded as insufficient to explain all the propositions. Consciousness was no ground of certitude, reason was the organ of philosophy, and reason was impersonal. The identity of being and knowing took the place of consciousness, and became the basis of all speculation. His system had more influence in the department of nature than in anything else.

Hegel, born in 1770, brought out a new system. He advocated that whatever was true of the thought was true of the thing. Ideas and the objects were correlative and equally true. He says that non-existence, the nothing exists, because it is a thought. He believed in contraries. He declared that identity of con-

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traries was the very condition of all existence, without a contrary nothing could come into being. Being was at the same time non-being. Light was darkness and darkness was light. In his philosophy of religion he believed in the trinity, God, the father was before the world and created it. The vulgar notion of theologians is that God created the world by an act, but Hegel says that the creation is not an act, but an eternal moment,—not a thing done, but a thing perpetually doing. God did not create the world, he is eternally creating it. He did not believe in the prevailing notion that God, having created the world by an act of his will, lets it develop itself with no interference of his.

Auguste Comte flourished in 1832. He was considered the father of Positive Philosophy. He advances three propositions: First, Philosophy is identical with science. Every special science is but a branch of Positive Philosophy. Second is that of classification. Third, conception is that of the fundamental law of evolution, evolution of thought.

Ferrari held that experience was the only foundation of truth. He attempted a philo-

sophical reconstruction of the political development of nations founded entirely on experience and induction. Some others contend that the province of philosophy must be confined within the limits of natural science.

Herbert Spencer's philosophy is a synthetic philosophy, that is, studying and accumulating all the particulars and details and then embracing or gathering them together towards building one general subject or method or general philosophy. He advances the proposition that the population of the world should not and does not increase any faster than the existence of subsistence to supply the necessities of the inhabitants. Population decreases in proportion to the decrease of subsistence or should do so by plagues, pestilence, wars, etc., or less births. His philosophies include, the philosophy of ethics, philosophy of sociology, philosophy of religion and other subjects equally important.

It will be seen on reviewing the doctrines of these philosophers I have outlined, and they are the leading savants of the ages, that their philosophies are simply a play upon theoreti-

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cal and rhetorical terms, exhibiting ingenious methods for the display of highly wrought mental gymnastics and an effort on the part of each philosopher to outdo or overthrow altogether the philosophy of his predecessor and establish a new school or a new method of presentation of ideas with all the force of mental vigor of which he was capable. Take the early philosophers. Thales, who advocated the notion that moisture was the fountain from which everything sprang, and Anaximenes, who advanced the theory that air was the basic element of life and that everything was dependent upon it, and then Diogenes of Apollonio, who thought that air was the basis of the soul, the living, intelligent force. With equal consistency, these philosophers might claim that heat was the living, vital force, on which all living things depended for existence.

The philosophy of Pythagoras, one of the most prominent of ancient philosophers, claimed, as we have seen as one of his theories, that numbers was the cause of the material existence of things. One (the initial number) of course is the beginning and the chief cor-

ner-stone of the mathematical world, without it figures would lose its prop or foundation, but to say that "it is the cause of existence," is an absurdity that reason cannot sanction.

Xenophanes displayed more sense in his school of philosophy than most of the ancients, with especial reference to his argument in relation to self-existence, where he proclaims that God must be self-existent, for "to conceive of being as incipient was impossible. Nothing can be produced from nothing. If Being is self-existent it is consequently eternal," and so it may be inferred from his argument, that man is self-existent and always was in some form, and consequently eternal. While Xenophanes advocated that sense was the only criterion of things and the only source of knowledge, Anaxagoras, who followed after, denied certainty to senses, they did not see the essence of things, but only the appearance, the phenomena, not the noumena. So here we see contradictory philosophies, and it is possible that both are right, for it resolves itself simply in a quibble or wrangle of words or terms. What do we find in the Sophists, we

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find their arguments resting upon the surface of things, were shallow, and without depth. They came to destroy, and produced nothing, they believed in having a good time. Notwithstanding their pretensions they were not philosophers in the true sense of the word.

The advent of Socrates in the world of mentality has been considered an important milestone in the history of philosophy. His processes of thought was displayed by Induction, a method of study in which all the particulars, the details, the branches of a topic were first investigated, and then generalized into one great whole, but "induction we saw," says Macauley, "is nothing new, but has been practiced by everybody, who is accustomed to reasoning, since the world began. Socrates established no prominent system, he paid great stress upon "Definition" and why shouldn't he. His method of questioning was perhaps the most original factor with him, but his life, a comparative spotless life, was after all the one thing that commends this man to posterity. What do we find in the Cynics, represented by Antisthenes and Diogenes to

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commend itself for our consideration or imitation? Nothing! nothing but the underlying principle of virtue that controlled their thoughts and action, but the manifestation and expression of this sublime attribute, in its naked form as presented by them to a cultured humanity, unadorned by the civilities and decencies respected and practised by man, degraded them to the level of a lower order of animal life, notwithstanding their denunciation of the sensual and gluttonous habits and pleasures practiced by man. Plato was one of the great lights of his age. He is known largely as the expounder and interpreter of Socrates, and it may be said he had the great mental capacity of absorbing and expounding all the great thoughts advanced by the philosophical advocates preceding him. He was a realist and what reasonable being existing who is not.

Aristotle was one of the greatest philosophers, if not the greatest philosopher, who lived in ancient times. So great was he that he embodied all the truths advanced by his distinguished predecessors, truths, not untruths, adding new theories of his own and

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they lived for nearly 2,000 years, for all philosophers appearing after him were so eclipsed by his greatness they sank into oblivion. The sceptics and stoics followed after, also the Alexandrian philosophers, but they added nothing new to the world of philosophy. Notwithstanding the greatness of Aristotle, the only prominent system he added to those of his predecessors was, that experience was the basis of all truths, and who can doubt that it is the fundamental stepping stone to our thoughts and actions, but it would not seem that it should take centuries to arrive at a true conception of that fact. In 1561—nearly 2,000 years later—another prominent philosopher appeared in the person of Bacon, but he presented no important theory in philosophy not advocated by the ancient philosophers. He is claimed to be the father of experimental philosophy, but we have seen that Aristotle advocated that doctrine to a large extent. The Inductive method advocated by Bacon was the Socrocratic method, only Socrates believed in the study of it as applied to thought within, while Bacon believed in its application to

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nature without, and so we find with most of his philosophy the mode of presentation varied to some extent with that of his predecessors. As we pass down the line of our modern philosophers since Bacon, we find that consciousness was the foundation of Descartes doctrine, but denied by Schelling as the true ground for certitude, and then appears Hegel with his philosophy of contraries, that here lies the great factor of our progress, and we must not forget Locke with his natural and practical method of investigation, and his doctrine of senses being the criterion of truth, already advocated by some of his predecessors, and although Auguste Comte is termed the "father of Positive Philosophy," Aristotle adopted this method largely in the presentation of his views more than 2,000 years before Comte. The latter varies from him in his classification of the method presented. It will be seen in studying the systems of the philosophers of both ancient and modern, that there is an abundance of repetition among them, and that there has not been a great advance in modern thought upon these philosophical

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problems and propositions up to the present century. The modes and methods have changed somewhat, but principles very little. The questions involving the thoughts of the savants have been more in the line of moral, spiritual, social and mental hygiene of man, upon which opinions will vary (without arriving at any absolute certitude) instead of investigations of the more practical problems of the forces of the natural world and the Universe, which must demand greater attention and thought in the studies of future philosophers.

CHAPTER VII.

Do Rocks Contain Life.

To say that rocks contain life, is a radical assertion, nevertheless, I shall advance the proposition. We say a thing has life that possesses the power to grow and develop. Rocks do not apparently possess this quality, but when we study their structure carefully and thoughtfully we find changes in their forms have been constantly occurring. Look at the pure crystal; has that not passed through a process of development, from the simplest amorphous rock to the highest crystallization? We say that is due to some chemical action, largely through heat. It is simply the manifestation of a force; not that heat is the force itself any more than the power of speech is the force. Speech is simply the manifestation of that force which is behind both speech and brain and unseen. So an unseen force is behind heat, the latter being simply the phe-

nomena, and not the noumena, the power that prompts or propels it. Heat I do not regard as a link in the correlation of forces; but a link in the primary manifestations of force, correlated to each other, as light, motion, electricity, magnetism, etc. These are all resolved or reduced to one primary force, which produces said primary correlative manifestations.

Spend an evening with an experimenter in this line of work, as we have with Tyndall in the lecture room, and watch his experiments in crystallization. As soon as the current of electricity begins to pass through a certain liquid, the wire becomes covered with bubbles, and foliage develops with the most extraordinary rapidity. The particles seem to form in the liquid, and rush with violence to attach themselves in leaves and frond-like forms to the attractive wire. The general appearance of the tree there formed, is fern-like and graceful. Some one says, "In the process of crystallization nature first reveals herself a builder." Where do her operations stop? Does she continue by the play of the same forces to form the vegetable and afterward

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the animal? Whatever the answer to these questions may be, the notions of coming generations regarding this mysterious thing which some have called brute matter will be very different from those in generations past. Life in each kingdom is differently developed. In the animal kingdom, growth of stature ceases at a certain age, while in the vegetable kingdom it continues through the individual existence of the plant. The former possesses the power to move from place to place at will, the latter is fixed to one spot, and derives its nourishment chiefly through the lower part of its organism, while the sustenance of the animal kingdom is taken through the upper. The resulting processes of these developments are easily explained, save the cessation of growth of man or animals at a certain age; and why said physical growth does not continue through life as with the plant, is not yet satisfactorily understood. All of these processes and developments, however, are simply the results of some unexplained force which propels and gives shape and form to matter, not only in the animal and vegetable kingdoms, but

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in the mineral kingdom, which manifests itself, though differently, yet most distinctly in varied crystallizations.

The differentiation in life is very marked in the development of our planet. To-day in man, more than all others in the broad realms of nature, dwell the greatest and the widest manifestations of life. Like the beast, he enjoys the powers of locomotion, self-defense, etc., but more than that, he enjoys an intellect as varied as it is great, and as far beyond the beast as the latter is beyond the oyster, or the oyster beyond the lowest form or manifestation of animal life. In the first, the most recent planetary development, man, we find the broadest variety; in the beast its development is less marked; in the oyster the differentiation in life is reduced to a very narrow limit; in protoplasm, the base, or the lowest round in the ladder of animal life, the variety of manifestation is as small as is possible to imagine in this kingdom. In the vegetable kingdom, differentiation is still less marked, for life is manifested only in reproduction and growth with changing forms, while in the mineral

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kingdom, the variety of life's manifestation is reduced to the lowest or narrowest limit in matter as a solid; its manifestation though less apparent than in the higher kingdoms, is nevertheless to the investigator positive, for growth and change of form through crystallization is everywhere observed. Vegetation develops largely through the influence of heat; so does crystallization in the mineral kingdom develop largely through the same manifestation of force. One writer claims that electricity is the basis of life, but be it heat or electricity that animates the vegetable and animal kingdoms, must not we claim that through both of them the mineral kingdom develops and changes form through crystallization; but as previously stated, both heat and electricity are correlated manifestations of a force that prompts the action; the latter we may call the vital element which animates the universe, giving life to rocks through crystallization and development, to plants and animals through germination. To produce a good plant we must see the soil contains those mineral properties which we know the plant, upon analysis, itself possesses,

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for the plant is simply a mineral or minerals with gases reproduced or developed, or in other words metamorphosed into vegetable life.

CHAPTER VIII.

Is There a Center, an End or Limit to the Universe?

In ancient days the Earth was considered the center of the Universe. Small was our planet to the ancients as compared to the present known dimensions. Aristotle, three hundred and fifty years B. C., limited it on the North by Ireland, on the South by the northern part of Africa, on the West by Guadalquivir, and on the East by the Indus or Hindostan. In the second century Ptolemy enlarged the boundary by placing Norway as its northern limit, a spot near Madagascar, the southern; the Canary Isles its western, and China the extreme point on the east. At the time of the flood—many centuries before the birth of Aristotle—the known boundaries of the world to those old patriarchs must have been so narrow that it is a matter of surprise the freshet recorded as covering this small strip of earth

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was not amended to include the universe, the knowledge of which being as dimunitive as of the globe which to them was a flat surface that they inhabited. In the age of Homer a great sea is made to surround the narrow limits of the earth, and even after the discovery of the Canary Isles, geographers portrayed huge statues on those islands flourishing mammoth clubs to prevent explorers passing beyond, and not until the ninth century did the geographical knowledge of the boundaries of the world increase. Then the discovery of Greenland was made by the Norwegians. In the thirteenth century Marco Polo's discovery enlarged the boundaries on the East, while in the early part of the fifteenth century, the southern limit was extended through the discoveries in Africa by the Portuguese, and still later, in 1479, further increased by the doubling of Cape of Good Hope by Vasca de Gama. Up to this period, or the year 1492 only one-half of the world was discovered, the great hemisphere of the west was unknown, then came the brilliant discoveries of Columbus, which were soon followed by those of the Cab-

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ots, De Soto, Pinzon, Balboa, Magellan and others, and it is not but a century since that a very large portion of the Southern hemisphere lay unexplored, and to the greatest of modern navigators, Capt. Cook, do we owe largely the extension of its boundaries, and thus only step by step, have we become acquainted with the contour and dimensions of the planet we inhabit. Among the ancients the belief more or less prevailed that the starry heaven was a crystal vault, or a large ice belt surrounding us, and the points called the stars simply prominent crystals projecting from the ice mass. This notion was at last dispelled, but the earth was still supposed to be the center of the Universe, around which all bodies in space revolved, and not until the sixteenth century did Copernius, after investigating the Ptolmaic, Pythagorean and Egyptian systems, together with that of Philolans and others, announce to the world that the moon only revolved around the Earth, while the latter, situated between the orbits of Venus and Mars, revolved with all the planets around the sun. It was long before the world accepted the

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Copernican system. Galileo must first suffer imprisonment for its advocacy, and to-day the system is so generally acknowledged that should one dare to oppose it, it is possible he might lodge in an asylum for the insane. The age has so far advanced that astronomical facts and laws are no longer a matter of speculation, but are actually demonstrated or proven by systematical mathematical calculations. One is not obliged to climb the summit of St. Peter to ascertain its height, but by taking certain angles below, its measurements can be given exact. So with the stars, their distances from the earth can be easily found and through mathematical reckoning, their velocity and size in many instances accurately ascertained. Our Sun even although holding and controlling all matter within billions of miles from it in its firm grasp, does not reign supreme as the center of the Universe, but is moving on. Alcyone, the central star in that beautiful cluster called Pleides in Taurus, was fixed upon by some as the center of the Universe, around whom the stars revolved and upon which was situated the throne of God.

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This is now amended by substituting some other center far beyond our unaided or aided sight, around which Alcyone and the circles of stars filling the area of our limited vision revolve. The extent of this vast Universe is beyond the comprehension of man. To comprehend anything of which we can have no practical knowledge upon the Earth is an impossibility. We can conceive of space about us limited, but of unlimited space we cannot. A limit to anything imaginable, must be necessarily bounded by something beyond it. So it is with the Universe; a limited Universe or one with a center implies a boundary. And what shall it be bounded by? What lies beyond it? Matter? What form of matter? And if not matter can it be less than space. Nothing can exist without space, and if space, what shall form the line of limit between the limited Universe and this space beyond. Shall it be walled? If it appears at first thought that the Universe must be limited, reflect and consider that if space lies beyond the limit, (and the absence of space is incomprehensible), why is not that included in the Universe,

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a part and parcel thereof. In a word, does not the Universe, include all, everything, whether matter, force, thought, spirit, time or space? What can possibly exist outside of it? Nothing within the scope of our conception. It would appear then that a limited Universe is incomprehensible. Can we conceive of a Universe without a limit? It is unquestionably easier to understand that the Universe can be unlimited than limited, for it appeals more to our common sense that it cannot be bounded, although it is impossible for man to conceive of the Universe or space as endless.

The immensity of the Universe can be partially understood (and by using the word partially, I mean as far as our calculation and aided vision extends) by examining the record of distances of some of the stars from us. According to Guillemin, a German astronomer, the nearest fixed star is 211,330 radii of the Earth's orbit, or to put it in miles, the radius of the Earth's orbit is about 95,000,000 which multiplied by 211,330 equals 20,076,350,000,-000 miles distant, this distance is so great that light travelling at the rate of about 192,000

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miles per second or around the Earth $7\frac{1}{2}$ times in a second, would take some $3\frac{1}{2}$ years to reach us. Sirius, the Dog star, is computed to be some 130,625,000,000,000 miles from us and the time it would take for its light to reach us, should it start to-day, would be about 22 years, or to make its distance from us still more comprehensive, suppose it were possible for sound to reach that star and that in our ambitious Napoleonic flights we should bombard it and send from our planet a ball from the cannon's mouth, although the flash of it would reach it in 22 years, the inhabitants would have sufficient time to make good their escape, for it would be some two million of years before they, or rather the spot aimed at would be struck, and a million of years more before the report of the discharge would be heard, and were the limbs of the sons of this star elastic enough to stretch to the Earth and give our quarrelsome inhabitants a fisting for this intrusion we could cleave the hands from the bodies of these avenging sons and pain traveling with the rapidity of sensation in the human system in informing the brain of the

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injury, fifteen million of years would elapse before the sensation would reach the grand sensorium in the brain of the sons of Sirius, and were it possible for them to send proposals of peace by a messenger on an express train to the earth, running night and day thirty miles an hour, it would take seventy-two millions of years ere the papers could be laid before the people of our planet and the conflict settled. Some stars seen only by the largest telescope are so distant from us, that should a ray of light start from them at this moment it would take thousands of years to reach us, and it is probable that if we could wing our flight to those distant stars, we should find just as many in the unlimited distance beyond as those left behind. Should we continue our flight onward, worlds beyond worlds would ever meet our gaze. We thus begin to creep into the shadow of dim realization, that we are but a drop in the vast Universal ocean and can comprehend as little of the immensity of the Universe, as the infant at its mother's breast can intelligently understand the vastness and area occupied by the land and water upon

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the Earth's surface, and with equal difficulty is it possible for us to comprehend a center, and end or limit to the vast space above us.

CHAPTER IX.

Moon and the Weather.

This is an inquiry into the proposition whether the moon has anything to do with the weather. All scientists are agreed that the moon's and sun's attraction is largely the cause of tides upon the earth. A cursory investigation of this phenomena will be necessary to aid us in our research. All bodies in the heavens are attracted toward each other in proportion to their size and distances. Although the Moon is much smaller than the Earth, it attracts the latter towards itself in proportion as the size of the Earth is to the size of the Moon; the force of attraction of the latter upon the Earth is sufficient to pull the Earth to itself a distance of two thousand miles. Now the Moon's attraction of that particular point or side of the Earth presented during its rotation on its axis nearest to our

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satellite, is greater even than the attraction of the Sun, although the attraction of the latter for the Earth as a whole is vastly greater than the Moon's attraction; hence the water upon the Earth being a liquid, and far lighter than the solid portion, is easier attracted by the Moon on that portion of the Earth's surface turned towards it. Now regarding the ocean covering three quarters of the Earth's surface as one huge drop of water, the Moon's attraction in pulling the water toward it, elongates the drop. The portion of it on the side facing the Moon, and the nearest to it, being pulled or drawn towards it, accounts for the high tide on this side, while the waters between the two ends of said elongation must necessarily be shallow or low, which accounts for the low tide on both sides of the Earth between the portion facing the Moon and the side opposite; and the elongated end on said opposite side of the globe being pulled or attracted by the sun, at the full of the Moon, will also explain the cause of the deep waters or high course of tides, making two high tides and two low tides on the opposite parts

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of the earth at the same moment. We are now prepared to study the hypothesis which I originally advanced a quarter of a century ago in the Boston Commonwealth in relation to the influence of the full moon upon the weather. The atmosphere surrounding the Earth, is a substance, as much as water, only not as dense ; its weight is many thousand tons. There are tides of atmosphere as well as water, only the former are far greater than the latter, because a light substance is more easily attracted than a denser substance. A storm approaching a day or two before the full of the moon is apt to continue until the moon fulls, and then generally ceases. Why is this? It must be due to the same reason that causes the tides of the ocean to rise and fall ; the Moon attracts the clouds and pulls them, as it were, towards itself, and much more at the full of the moon, and when new, than at any other phase, the same as it attracts the waters more at its full, and new, and why? It is well known that the sun attracts the waters of the Earth as well as the Moon, but not as much, the Sun's attraction being in the ratio of

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about one-third to two-thirds of the moon; hence when the moon is full it is on one side of the Earth, while the Sun is directly (or nearly) opposite on the other side, and as both are on the same line or plane with the Earth, both the Sun and the Moon attract or pull the huge drop of water called the ocean, on opposite sides; hence the elongation of the drop is far greater, and the tides much higher, than when these heavenly bodies are not on the same line or plane, and directly opposite. Hence it will be observed that the full moon will attract or pull the clouds away from the earth more than at any other phase, and consequently the clouds being farther removed, are more likely to become scattered and broken; when this takes place the storm must of course necessarily abate, or else as is often the case, the severity of the storm is too great to be effected by said attraction, and hence when there is a storm on the full of the moon, it is a very severe one, too severe to be controlled by the moon's attraction. All sailors are familiar with this phenomena, though not able to explain the cause.

CHAPTER X.

Philosophy of Transition and Unrest.

Transition is the law of the Universe. Absolute rest in any form is an impossibility. An acorn sprouts from the Earth, develops into a giant oak. It is leveled to the ground, sent to the mill, sawed into lumber and framed into a house. Man cudgels his brains to stay the hand of the great leveler, but his efforts are but momentarily, it is only a question of time, the building must surely fall, transition is the law, rest is imaginary, unreal. The edifice decomposes and returns to the Earth from which it sprang, years pass on and the matter composing it passes again into vegetation and were the existence of man long enough here below, and his power of vision great enough, he would observe the changes in passing from one state into another in its process of decomposition, its reunion with other elements, and its gradual development into an or-

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ganic existence. Should it fail to reach again the aristocracy of lumber for the house, or a royal position in the ship, or fall in its incipient stages of existence, a victim of the fireplace, or still lower into the depths of futurity, to lay and rot, smother and sweat under the heavy burden of centuries and then be disturbed in its rocky bed of coal in the bowels of the earth, lifted into the light of day to burn and be consumed for the comfort of man, the change must come in some form. .

While some forms of matter can make the cycle of transition within the limits of a century, others take centuries. Observe the action of water and air upon the rock and note the wear and waste which even in a century is noticeable, especially rocks of moderate hardness. Even where the ledge of rock lies undisturbed for centuries the expansion and contraction of spaces between the atoms and molecules composing it makes rest impossible in this as in all forms of matter. Turn to the stars and watch their motions in space, day after day, year after year, century after century, and thousands upon thousands of

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years roll on, without any perceptible change apparent in them, yet the change going on is constant, but the existence of man on earth is so brief compared even to the developments of our planet, men cannot measure the growth and decay of these bodies.

How vast then must have been the transition in man, in the development of his body and mind, evolving from the lower to the higher through the line of ages in the past; it simply contributes to the long chain of evidence in support of the eternal law of transition throughout all forms of matter. Change, philosophically viewed is a priceless blessing, while absolute rest, if it were possible, would be a curse of unmeasured possibilities.

The changes produced upon the Earth and other worlds are comparatively small since the advent of man upon the globe. What is six days or five hundred thousand years in the development of our planet? it is a mere drop in the ocean of time occupied in effecting changes so apparent at this stage of the Earth's history. These changes are at work to-day, but they are measured by ages, not hours or days. Take

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for example the coal fields of Pennsylvania, the decomposition of plants and their gradual conversion into coal is still going on.

Through the investigations of the eminent geologist, Prof. Dana, we learn that some two thousand years are occupied in the accumulation of one foot of coal, hence centuries must elapse ere this change or increase is at all perceptible. As we stand upon the bank of a running stream, and view the steady march over its rocky bed, we are unaware of the gradual diminution or waste of the rock, caused by the unobserved wearing action of water in motion. With delight, attended with wonder and amazement we see the great Niagara rushing headlong over the rocky cliff, little aware as we view it, that the falls are receding and the gorge through which the river flows (some seven miles long and 200 feet or more in depth) was cut by the erosive action of this falling stream one foot a year, which in the same ratio must have occupied some 36,000 years to have cut the gorge its present length. The cañon of the Colorado presents to us features more

marvelous even, in the slow and continuous erosive action of the running stream. There a gorge some 250 miles in length with high embankments, in some places reaching one, two and three thousand feet through a solid rock eight miles long and some 800 feet in depth, must have occupied, according to some estimates 250,000 years to have accomplished the entire cut that nature there exhibits. Air in motion is equally slow but sure in wearing away the prominences of the Earth's surface. "The mills of the Gods grind slow but exceeding sure." Toss a ball through the air and if it were not for gravitation and the resistance of the atmosphere opposing its passage, the ball would move on forever, the same as the Earth when separating or thrown off from the great planetary and solar nebula mass, the motion or impetus given it, continued from the beginning rolling through space, rotating daily on its axis and making its yearly revolution about the central mass, the Sun, at the same time, as some astronomers assert, moving along with the latter and sister planets towards the Constellation Hercules at the speed of 158,105 miles an

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hour. These movements are imperceptible to our ordinary senses, as imperceptible as the rapid movement of the railroad car in which we travel; should the fixed objects observed from the window in passing be removed from our view, nothing is left to measure at sight the rapidity of motion, and it is only through a familiarity with astronomical science and physics that the movement of bodies through space is at all understood or appreciated.

CHAPTER XI.

Reason in Animals.

Reason is the deliberate exercise of thought. Instinct is the hereditary transmission of a fixed habit, the latter is as inherent in man as in the brute. Some men are moved more by instinct than reason, they are ushered into existence a helpless, thoughtless babe, and with the instinct of a brute nurses as readily as a pup or a calf. Years pass by and it develops into manhood, he goes to the polls, asks no questions, reasons not with himself or anybody else, but mechanically and instinctively votes as his papa and his great grand papa voted. He attends church, pays liberally to its support, and should he be asked why he attends this special church, he perhaps may be able to repeat the creed, further than that he knows nothing, sufficient is it for him that his father, his great grandfather and the whole line of ancestors belonged to the same church, be it

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Catholic, Methodist, or Universalist, to him it is simply mechanical, instinctive, a hereditary custom or habit, that prompts his attendance to his place of worship, not reason, hence instinct is a part of man's make-up, as with animals, and reason is a part of the animal's function, as it is in man, but of course in a far less degree. Take our most domesticated animal, the dog, observe his movements when in search of his master as he approaches the crotch of two roads. He hesitates as to which road to take, he looks up one road and then the other, he is puzzled which to choose. Why does he hesitate? It is because he is exercising his reason and thinking which road his master took. If it was instinct he would not hesitate and puzzle his brain, and if it was the scent of his master's footsteps, he would not hesitate to follow it whichever way it led, but he has lost the scent, and must exercise his reason to determine which road to choose, and after careful consideration, he decides and off he trots on the road of his choice. An elephant as he approaches a bridge, hesitates before crossing. He tests the structure

by putting one foot carefully upon it, if in his opinion it is strong enough to hold him, he will proceed cautiously along, reasoning the while in his progress over it. If in his opinion it is not strong enough to hold his massive form, no power on earth can force him to walk over it. A monkey will carry a stone up a tree and drop it on a nut on the ground to crack it. Many faculties possessed by man are enjoyed by the lower animals. Horses like men possess good and bad dispositions. Some are kind and gentle and never stirred to anger, others are easily excited and show their resentment at the foot of the first hill; they'll not budge an inch until their stubborn will is satisfied.

Dogs are as jealous as men and some women when more attention and praise are given others than to them. Monkeys display the same affection and common sense for their young as man. A cat speaks when she stands at a door and asks its mistress to open it. A dog speaks when he observes his master with a piece of meat; his bark is pleading for it. Some time ago a couple of men sat by the hearth in the country, a dog lay sprawled at

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their feet. The dog's master spoke to his friend concerning the remarkable intelligence displayed by the animal and to test it, he said he would give him a command and would not change his tone as he continued his conversation, "The cows," said he, "are in the potato patch." In an instant the dog jumped up, looked around and rushed out of doors and hastened to the potato patch. Not finding the cows therein he returned to his master. After a brief spell his master repeated in his conversation with his friend the same command, and the dog hastened to the same patch again, but with the same result. No cows were there. He returned and laid down at the feet of his master. In a few minutes the master repeated the same command. The dog arose and looked knowingly into his master's face as much as to say, "No you don't. You don't fool me again," and laid down undisturbed to his rest. Articulation is not confined to man. The jackadaw, the magpie and the parrot chatter with ease, and at times much reason is displayed with it. A Mr. Jesse in England owned a parrot that would cry, laugh,

sneeze and cough, and then exclaim, "What a bad cold!" And when a lady entered would say "How d' ye do, marm. So bad, so bad, got such a cold." It would sing, and when it made a discord, he would exclaim, "Oh la!" and begin again on another key. When one enquired where Mrs. Jesse was, the parrot would cry out. "Down stairs." When laughing, it would stop and exclaim, "Don't make me laugh so. I shall die! I shall die!"

A lighted cigar was put into his cage. The smoke annoyed him. He clutched the cigar in his claws and threw it out of his cage and was relieved. Was that instinct? Instinct is a fixed habit. This incident was accidental, and to get rid of the disagreeable tobacco fumes required a little thought, and nothing but thought in the form of reason, could have prompted the parrot in his deliberate manner to remove the cause of its annoyance. An ape when taught to use spoons to feed itself will do it easily, and it will also make its bed and lay in it like man. A monkey domesticated with a cat, was annoyed by the feline scratching him at play. So at once to rid

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himself of that annoyance, he grabbed the cat and proceeded to bite off its claws. After its successful accomplishment he rested satisfied that he would have no further trouble. There was cause and effect, and the reasoning of the monkey must have been in that line to have proceeded with the cat in that manner. Nearly all animals have brains. Some more than others, and this inequality is quite conspicuous among men. In some of the lower order of animals the brains are very minute, and not confined to the head, but are scattered along the entire length of their body in two or three ganglions or bunches. The very lowest order of animals have no brains, and from them we see not the slightest manifestation of thought, either instinct or reason. Just what we might expect in the absence of brains. But as we advance higher in the scale of life, brains develop. The horse is the noblest of all animals, and to deny him the power of thought is an insult to his acknowledged intelligence. Prof. Kruger relates a story of a horse that outrivaled the sagacity and fidelity of the dog. "A friend of mine," says he, "who

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was one dark night riding home through a wood, had the misfortune to strike his head against the branch of a tree and fell from his horse stunned by the blow. The horse immediately returned to the house they had left, which stood about a mile distant. He found the door closed, the family had retired to bed. He pawed at the door until one of them hearing the noise arose and opened it, and to his surprise saw the horse of his friend. No sooner was the door opened than the horse turned around, and the man suspecting there was something wrong, followed the animal, which led him directly to the spot where his master lay on the ground in a fainting fit. Another is related of a horse who exhibited more reason and common sense than his master. The latter returning home one evening drank rather hard at an ale house. He could not keep an erect position on his horse, and rolled off the animal into the road. His horse stood still, but after remaining patiently for some time and not perceiving any disposition in his rider to get up and proceed farther, he took him by the collar and shook him.. This had

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little or no effect, for the man only gave a grumble of dissatisfaction at having his repose disturbed. The horse was not to be put off with any such evasion, and so he applied his mouth to one of his coat laps, and after several attempts by dragging at it to raise him upon his feet, the coat lap gave way. Three individuals who witnessed this extraordinary proceeding then went up and assisted in putting the fellow on his horse, who trotted away and safely reached his home. Brains we find in animals no higher than insects, and here we expect to find the manifestation of thought and reason just in proportion to the quantity and quality of brain mass, and this we find among the insects in the ant and bee. The ants form a colony and engage in battle—one colony with another—in the struggle for supremacy the same as man. The bee displays remarkable intelligence in all of their movements. A fox exhibits a deal of thought when caught in a trap and released. He will play dead, and elude his captors by escaping when their backs are turned.

Another illustration of reason in animals

was exhibited in my cat at home. When he is in the house at night, I usually put him down cellar, but one night failing to find him, I supposed he was out of doors, and hence retired to my chamber. I had but just got into bed, when there was a rattling of my door. It was the habit of our cat to reach up to the knob of any door he wanted opened and rattle the knob to be let into the room. On hearing a rattle of my chamber door knob, I jumped out of bed and opened the door, and there to my surprise our cat stood and mewed as if to say, "Come down stairs and open the cellar door and let me down." The moment I opened the chamber door he looked up into my face, mewed and passed down the stairs, turning partially around to see if I was following him, and then went to the cellar door and mewed again for me to open the door and let him down, which I did. The cat reasoned that I had retired; he wanted to go down cellar, and the only way it could be done was to go up stairs, knock on my door by shaking the knob, and ask me in cat talk to go down and open the door. There was no instinct

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about that, it was reason pure and simple.

The vertical portion of the brain is nearly as large in the dolphin, as in man, and nearly so horizontally. But in the anterior portion it is only about half. The tiger and dromedary stand next. The vultures stand first among the birds. The size of the brain in animals, however, does not always indicate the capacity of thought, or amount of intelligence, for that depends largely on the convolutions, the windings and intricacies of the brain as well as the amount of gray matter therein. In the complexity of the convolutions and the thickness of the gray matter in the cerebrum or the frontal portion of the brain, the seat of intelligence in man, far surpasses the dolphin. In these respects the higher quadramana present the nearest approach to it, but their brain is much inferior in size. In descending the scale of mammalia, there may be observed a gradual simplification in the general structure of the brain. Among all the birds there is none in which the brain is so proportionally large as in the parrot tribe. The educability of which, as shown in their

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prompt excercise of thought, is familiar to every one, while the domesticated, but unintelligent turkey has a brain of scarcely half the proportional size. The very small size of the cerebrum, the seat of intelligence in reptiles and fishes, present but feeble indications of intelligence. The shark among fishes has the largest cerebrum, the superior intelligence of which is well known to those who have had the opportunity of observing their habits, and it is interesting to remark that their brain occasionally presents an appearance of rudimentary convolutions.

"A little fish, named the Chaeloton Rostratus, is in the habit of ejecting from its prolonged snout, drops of fluid, which strike the insects that happen to be near the surface of the water and cause them to fall into it so as to come within its own reach. Now by laws of refraction of light, the place of the insect in the air will not really be that at which it appears to the fish in the water, but it will be a little below its apparent place, and to this point the aim must be directed. But the difference between the real

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and apparent place will not be constant, for the more perpendicularly the rays enter the water, the less will be the variation, and on the other hand the more oblique the direction the greater will be the difference." Says Dr. Carpenter in addition, "It is impossible, but that by an intuitive perception the real place of the insect is known to the fish in every instance as perfectly as it could be to the most sagacious human mathematician, or to a clever marksman who had learned the requisite allowance in the flight of a bird in each case by a long experience." One thing is certain, that the higher the degree of intelligence which we find characteristic of a particular race, the greater is the degree of variation that we meet in the characters of individuals, thus every one knows that there are stupid dogs and smart dogs, ill tempered dogs and good tempered dogs. And so with horses, as there are stupid men and smart men, ill tempered men and good tempered men, but no one can distinguish between a good or an ill tempered ant or between a good or an ill tempered spider, simply because all their actions are prompted by an un-

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varying instinct. What is the peculiarity of one class of insects is common with all in the same class, and today they are no more intelligent than a thousand years ago. That is instinct. In the higher class of animals this unvarying quality of habit does not prevail. For example (says Fowler) "We can by crossing vary the forms of cattle with astonishing nicety, but we have no means of altering the nature of the animal, once born, by means of treatment and feeding. This power, however, is undeniably possessed by the bees. When the queen bee is lost by death or otherwise, they choose a grub from among those who are born for workers, then make three cells into one and placing the grub there they build a tube around it. They afterward build another cell of a pyramidal form into which the grub grows. They feed it with peculiar food and tend it with extreme care. It becomes when transformed from the worm to the fly, not a worker, but a queen bee." The attachment of the dog, cat, horse or elephant, is evidently however of a much higher kind than of the more inferior animals, and involves a much

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larger number of considerations and their actions are evidently the result in many instances of a complex train of reasoning, different in no essential respect from that which man would perform in similar circumstances. "The epithet half reasoning," says Dr. Carpenter, "commonly applied to these animals does not express the whole truth, for their mental processes are of the same kind with those of man, differing only in degree." The quality of brain mass has more to do with the development of thought or reason than quantity, whether in man or beast.

We see this exemplified in man. Some possess large heads, and a large quantity of brain mass, but the quality is poor, and but little thought or reason is developed. Take the ant, if the brain filled the entire portion of its head the size would not be larger than the head of a pin, and the bee but little larger, and what a wonderful amount of instinctive intelligence is displayed in so small a space. If as much was exhibited in man in proportion to the size of his massive brain, vastly greater minds and works should we witness than in the past cen-

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turies. The time was when man was much lower in the scale of life than at present. The only tools the primitive or prehistoric man possessed were made of stone. Indians live to-day who use nothing but stone and wood implements. In my travels on the Pacific coast in 1874 I met a class of Indians and joined them in their feasts. Nothing but stone and willow baskets and fagots were used to cook their food. Nothing but hands in place of knives, forks and spoons was used to eat their food, and acorn soup eaten with fingers is not as easy a matter with civilized man. Most of the food eaten by these Indians was uncooked. Grasshoppers uncooked were counted choice morsels at their feasts. Worms were dug out of the bark of trees, and greedily devoured, and these we call men, and so they are, but little are they in advance of beasts and the ape. If these men are so low in our own time, how much lower must have been the primitive or prehistoric man ages and ages past. We speak of this to show that there is not so very wide a difference between the reason of the lowest races of men and the highest order of

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animals. True enough animals in general cannot talk, and yet when one listens to the matchless eloquence of Phillips, which lifts the very soul of man into unity with God, and turns to the wild Australian who can scarcely count four in his own tongue, and to the Wild men of Borneo whose only answer to your logic is a grunt, one is compelled to the conclusion that the speech or talk of the parrot and the intelligent answers given, is not so far below the lowest order of men as the latter is below the silvery tongued orator Phillips, or Gladstone. We speak of the savageness and brutality of beasts, and yet how little of this is manifested in domesticated animals. We find it more often exhibited in some men, as in the early history of Rome, England, and but a century or two ago in France. The Feejeeans kill their parents when old and decrepit, and eat men and women, enemies and captives. Our early aborigines in western regions, during their long marches, killed the lame and sick who hindered them in the progress of their journey. How much in advance are they of the noble Newfoundland dog who has saved so many

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lives from a watery grave, or the St. Bernard who upon the snowy Alps rescues the unfortunate traveller from an icy, cold grave. During the civil war of '61-'65 it was stated there were three Quakers in one of the Carolinas who were drafted in the Confederate army. Their peace principles forbade them engaging in war to kill their fellow man, and they refused to fight. The Confederates said they *must* fight and provoked at their repeated refusal, they bound their limbs, laid them on the ground and ordered the cavalry men to run their horses upon and trample them, but the horses were more reasonable, kind and thoughtful than their human masters, and leaped over the prostrate bodies of the Quakers, without touching them, and notwithstanding their repeated attempts to force the horses to trample them, they would not, and the men were released and sent home. It is because of the false, prevailing notion that the dumb animals possess no feeling, common with man, that we speak for them. It is because that the lexicographers define man as endowed with reason, and the dumb creation not, that

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we speak. It is because of the possession of these attributes by the higher order of animals in common with us, though in a far less degree, and the utter ignorance of the fact by most men, resulting in the injustice and cruelty meted to these silent creatures that we speak for them.

CHAPTER XII.

Probable cause of gold and silver ores being found in extensive mountain ranges only.

In my journeyings down into the bowels of the earth in Nevada and California for the purpose of studying the formation of gold and silver ores, I reached one conclusion, and that was no gold and silver ores will ever be found anywhere but in extensive mountain ranges. It is a noteworthy fact that the greatest gold and silver mines in our hemisphere are found in the Sierra Madre range in Mexico, the Colorado mines in the Rockies, the mines in the lofty Sierra Nevada range, and in the Andes of South America. Again, all the mountain ranges in our country and throughout the western hemisphere run northerly and southerly, so do the silver and gold lodes or veins of ore in all mines I have visited. Another fact is worthy of mention. I have noticed that

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in trap dikes in most of the ranges have the same tread northerly and southerly, and even the slabs pointing above ground that I have observed on the foot hills of these mountains, looking like grave stones in an ancient cemetery, preserved the same direction. Trap dikes, as is well known by scientists, are rocks formed by the action of heat. A fissure or crack due to some internal convulsions exists upon the earth's surface, and through the force of steam and gas generated below, the molten, plastic mass composing the trap dikes, is forced into the fissure and hardens in time into trap rock. The same process through the force of steam below the earth surface, forced gold, silver, copper, lead, quicksilver and all heavy ores into the open spaces or fissures, finely scattered about, and thus we find them in lodes or veins. This answers the question why we find these ores in veins or lodes, but it does not meet the question why we find gold and silver ore mostly confined to lofty mountain ranges, while other ores, such as copper, iron, lead, etc., are generally found elsewhere. To be sure we find some of these

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ores associated with gold and silver in extensive mountain ranges, but they are very scantily represented. The greatest copper mines, lead mines and iron are found a thousand miles or more from these lofty ranges. What then is the cause of gold and silver being generally confined to extensive and lofty mountain ranges in the western hemisphere? Modern science advances the theory that mountains were not suddenly elevated as formerly supposed, but are the result of gradual elevations; that the cooling off of our globe after the crust was formed, caused the depressions and elevations that we witness on the earth's crust to-day; and as time rolls on and the cooling of the earth continues, by the escape of heat from the interior, depressions and elevations will continue to increase, the same as the depressions and elevations upon the surface of a baked apple increases while the heat is escaping and the juices are drying and solidifying. To whatever extent this theory is true,—and no one can deny its truth—there is nothing in it to contradict the hypothesis which I now advance that the probable convulsion

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of the earth's fluid center in its early stages of development forced up molten masses through the crust, not to the height that the lofty mountain ranges have now attained, but to only a moderate height, and as the earth became higher developed by the immense loss of heat, and the crust grew harder and thicker, the elevation of these mountain ranges became more gradual and rose mostly through the contraction of the earth, causing elevations and depressions heretofore explained. Do we generally find gold and silver ores on the summits, or very far up the mountain side? Usually not. Most all mines I have visited were on the foot hills of these lofty ranges; and that corroborates the theory that when these ranges were first raised to moderate heights, gold and silver ores were forced up at the same time. This will now lead us into the immediate study of the causes of the peculiar location of these ores.

Gold and silver are among the heaviest of metals, especially gold, which has a specific gravity of nineteen. Platinum alone, of all the metals is heavier. It follows then of

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course that gold, being one of the heaviest of known substances sank, or remained in the centre of the earth mass during its liquid development, and when the early eruptions and elevations took place, heretofore explained, the force must have been terrific, to start from the earth's centre these heavy metals, as gold and silver, and the lofty mountain ranges upon which these ores are found. And how can we come to any different conclusion when we must know that gold and silver being among the heaviest of substances, obeyed the laws of gravity when the earth was a fluid mass, and could not have existed in any other place than at the lowest spot in the earth's centre. To ascertain this fact or law, fill, as I have done in California, a pan full of earth with small flakes of gold scattered through it, and wash the earth and heavy sand away. One need have no fear of the gold passing off, for it will invariably find its way to the bottom. The common earth passes away, then the black sand, and the pure gold remains. We must not lose sight of the fact that the eruptive or lifting force

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that it took to raise these heavy gold and silver ores from the centre to the earth's surface must have required the same gigantic force (and operating at the same time) that raised the loftiest and most extensive mountain ranges in our own hemisphere, and upon which as before stated, these ores are mostly found. It is upon this hypothesis, that I put little faith in the discovery or existence of any considerable amount of gold and silver on any spot of the earth's surface away from extensive mountain ranges. Some years ago there was an excitement in the town of Newbury, Mass., by the discovery of a little gold ore on one or more of the farms of that village. I had no faith in the continued mining of the ore, and so said this in the columns of the Boston *Commonwealth*, published a decade or more ago. The excitement and mining of the ore met a sudden death as predicted. Invest in no gold mine east of the Mississippi valley. Nova Scotia mines a little, but nothing in comparison to the great mines of the far west in the vast mountain ranges.

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